MOTOR AGE

Vol. XXXI
No. 20

CHICAGO, MAY 17, 1917

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Three dollars a year

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MOTOR AGE

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Vol. XXXI Chicago, May 17, 1917 No. 20

Contents

ANNOUNCEMENT

Do not fail to read the next installment of "Trailing a Trailer into the Rockies" if you are at all interested in this new method of carrying baggage. The writer takes up the problems a trailer is likely to give and solves them through his own experiences.

OPTIMISM

Studebaker Merchants in Every Part of the Country Predict an Unusual Era of Prosperity

OUR country is entering on an era of unusual prosperity. Industrial wages and prices of agricultural and farm products are higher than ever before. Our country is today the richest in the world. Studebaker merchants are enthusiastic for the future. Read what they say:

Philadelphia, Pa., April 23, 1917.
We expect to cash in on the existing prosperous conditions that prevail and the era of still greater prosperity upon which we are just entering. *Philadelphia Auto Sales Company.*

* * *

Billings, Mont., April 24, 1917.
We believe that dealers who prepare for the unusual prosperity developing in this country through the certain high prices for all products for sale by the producing community, will find fortune as they never found it before.
Automobile Warehouse & Service Company, of Montana.

* * *

Norfolk, Va., April 23, 1917.
Our country was never in such prosperous condition as today—Studebaker dealers are particularly fortunate at this time because of the unequaled popularity and value of Studebaker Cars. *Coburn Motor Car Company.*

* * *

Milwaukee, Wis., April 23, 1917.
Just now people want Studebaker automobiles; they have the money to pay for them and are buying them. Our retail business for April exceeded that of last year by several thousand dollars.
John G. Wollaeger Company.

Wichita, Kan., April 23, 1917.
Kansas is on easy street. It has money in the bank—more than ever before. Bank savings are from 25 to 100% more each week than the corresponding week of last year. Lay off the "pessimistic junk"—we don't know you.
Kansas Motor Car Company.

* * *

Denver, Colo., April 24, 1917.
People are spending their money freely and buying better cars than heretofore. We look for a continued increase in sales.
The Automobile Sales Corporation.

* * *

San Antonio, Texas, April 23, 1917.
Candidly we have never seen business as good at any time as it is right now.
Clem Motor Car Company.

* * *

St. Louis, Mo., April 25, 1917.
Business has been just as good with us since the war as before the war. We expect to land just as much business this season if not more than ever before. *Weber Motor Car Company.*

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It pays to be a Studebaker dealer

Vol. XXXI, No. 20 Chicago, May 17, 1917 $3.00 Per Year

MOTOR AGE

Trailing a Trailer into the Rockies

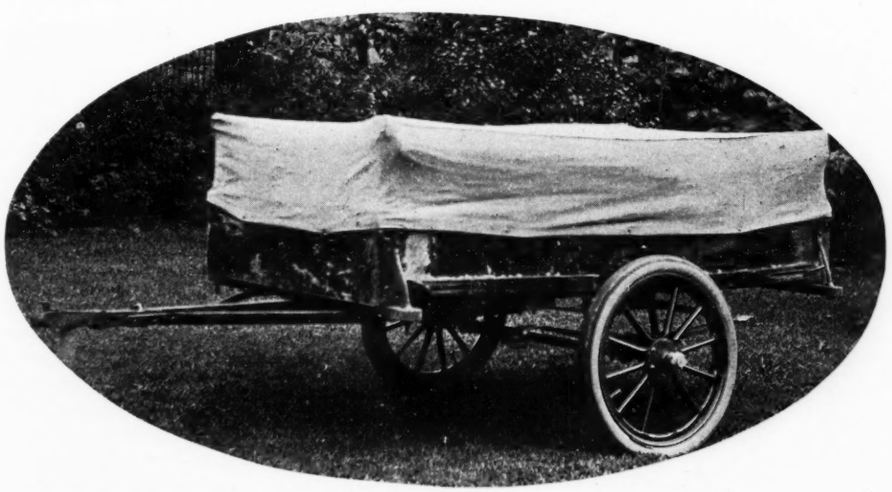
By W. A. LIPPMAN

Camping in July in the heart of the Rockies has all the comfort of home without the drudgery of housework, as well as the advantage of nature at her best. The trailer carries all baggage and equipment and leaves the car to the passengers

In Three Parts—Part I

IS it easier to pull or pack? Is it easier to drag along a hundred pounds behind you or tote it on your back? Who shall answer that question? There are scores of scientists and technical experts who can tell you all about this as a phase of the power problem, but to be very frank and honest about it, so far as the theory and technical principles are concerned, the trailer power problem is a vast bog of dense ignorance to me.

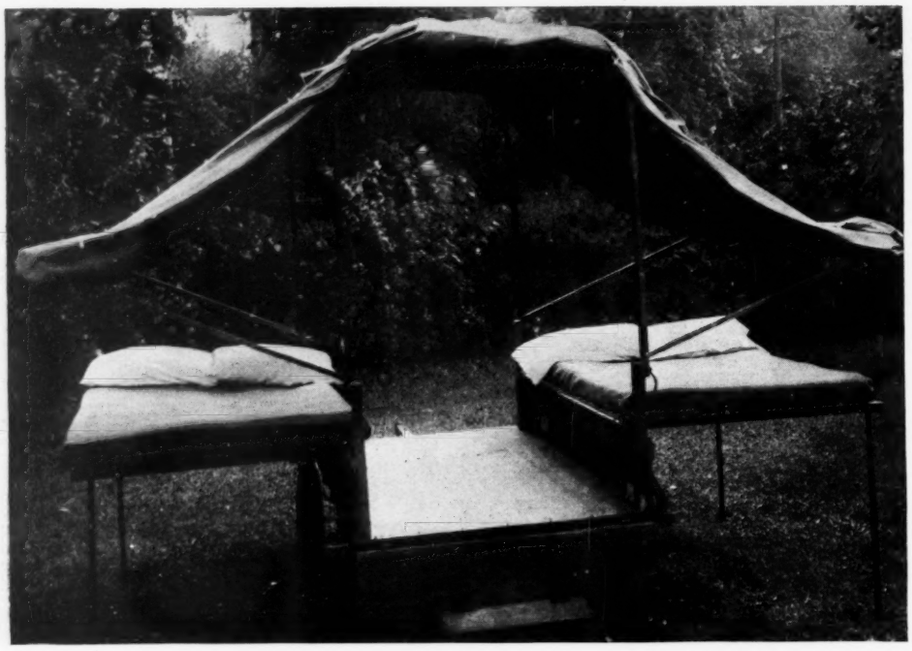
Like many others whose curiosity and desire have been aroused by various phases of motor travel, we have for some time coveted a trip with a trailer. Now it must not be assumed that this coveting has been without its fears and its doubts—quite to the contrary. We studied the problem from many viewpoints before we decided to give the trailer a trial. For instance, it occurred to us to wonder why had they never been used in an extensive way? Why had not some Ford or Willys of the motor world provided a trailer with all the various living paraphernalia required for venturing forth across prairies and mountains and enabling one to circumvent the hotel tavern keeper whose chief concern seems to be that of giving the motorist the most miserable sort of service, apparently justified by the dusty apparel and soiled appearance of the travelers—and yet with charge for high-grade accommodations.



"Old Betsy," as her owners called the trailer they trailed into the Rockies, ready for the road

Small Hotels Unprepared

It is a curious thing, but too seriously true, that many of the small town hotels and inns have not yet learned that there are many traveling motorists whose money is just as plentiful and of the same value as the coin which is extracted with more or less ease from the pocket of the traveling man. There are tourists without number jaunting about the country, in season and out, who really prefer that method of travel to the Pullman—many who go be-



Here is the trailer in the process of becoming living quarters for four. The beds have been unfolded and the canvas covering is being adjusted

cause they like the life better—who feel wholly satisfied with the simplicity permitted and the less formal requirements as to dress and habits.

In the West the difference is less noticeable, perhaps because jeans and jumpers often times decorate many of its most desirable and most influential citizens, and there being, moreover, a freer action and greater personal privilege with regard to the minute formalities of daily living. For instance, a travel-stained khaki shirt will occasion some stir in the lobby of the Auditorium or one of the Statlers, not to mention the furore which would follow in the fashionable struttery of the Astor or the Biltmore, but in the somewhat more ruralite atmosphere of the Baltimore at Kansas City or the Brown Palace in Denver, the Plains at Cheyenne or that new and beautiful hotel, the Utah, at Salt Lake, never a ripple is noted when such clothes are worn. Even a blue shirt—I might venture to add—will not occasion an order for the doorman to call the innocent wearer aside for whispered reproof.

Meets Snobbish Ideas

With all that, and it is one of the many phases or angles of touring to which our hostelries must readjust themselves if travelers are to be taken care of with true American hospitality, there are some snobbish ideas still prevailing in very unexpected spots. I will relate an incident without mentioning any names or telling where it occurred, except to say that it was in Kansas and in a town large enough to boast one of the excellent stations maintained by a certain large and prosperous restaurant system. We arrived in "Stillville"—the name will do—just at noon and were informed that splendid meals were served at the station hotel, the very mention of the name being enough to guarantee the quality. We were tired and hot and dusty and ready for a good big dinner of the sort that makes a new man of the old and puts energy into one for another day's work. After being seated, the sole guests throughout the meal, the writer was told in very polite but firm words that men were not allowed without coats in the dining-room and that the khaki outing shirt was not considered good form. The fact that the khaki coat, with which I decorated my person when en route, was hidden away underneath a lot of luggage in the car a block away, did not alter the imperious dictum of this western autocrat of fashion and correct dress. The coat was produced, regulations made a thousand miles away were satisfied and we ate in stolid protest against a rule that so foolishly added to the sweltering heat of 105 in the shade in hot old Kansas. This is a case that happily is not typical of the accommodations provided along the Santa Fe trail nor any of the other westerly routes over which so much travel now is pouring.

On the Denver Buena Vista highway near the Continental Divide

A Trailer with Personality

What about the trailer? We will come to that. It is difficult for me to tell about the trailer and the new mode of travel without relating connective incidents. You must be aware that the trailer, despite its name, did not just trail us in the fashion of the cockleburr hanging to the cow's tail—for it came to have an identity all its own, a sort of personality, one from which we never failed to draw something new and which, despite our best efforts, occasionally put one over on us to our utmost amazement, sometimes dismay and now and then an intense and craven desire to annihilate it.

No matter where you buy your trailer or what else it may have, it is certain to have—as did ours—those first essentials of touring comfort—bed springs and mattresses, a tent or canopy top, cooking apparatus and space to store away oodles of stuff that both annoy and comfort. No matter how carefully the maker may provide for your creature comfort he is sure to put in some things that you will learn to hate him for.

"Why?" you ask. "Why must this particular contraption be forced upon us and that most needed be left behind? Why could not this brace have been stronger or better fastened? And why, oh why, was that device made strong enough to haul heavy timber or lead ore instead of merely packing the clutter of camp life?"

Improvements Are Rapid

Take it easy—these things all have a purpose and none of the makers of trailers has had all the possible trailing experience; on the whole you will find that the trailer in one short year leaped forward from the dimmest obscurity to become one of the recognized touring factors, splendidly equipped considering its recent arrival.

Few of us will ever be completely satisfied with any travel arrangement—certainly no one pleads the perfection of even our most luxurious, solid Pullman trains—but I do not know of any touring scheme that equals the trailer, with its accompanying accessories making for convenience, necessity and—may I observe—adornment. The snail, with all the malignment heaped upon him—no doubt partly arising

from ancient historic mention of his processional and dignified speed—has had a distinct advantage over most other types of animal, including the human family, because he is able to cart his whole domestic housekeeping system upon his back, and not until the advent of the camping trailer has the human snail had the privilege of doing that. I have always envied the wandering gypsies in their wagon outfits, their ability to halt at any shady turn in the road and make camp for the night in a moment. Before we trailed forth with our "Betsy Ann" we never knew the comfort of having a good hotel with us all the time, the satisfaction of stopping wherever we wished with gypsy-like disregard and thereupon camping quickly and with an ease and comfort leaving little to be desired.

Trailer Is Best Hotel

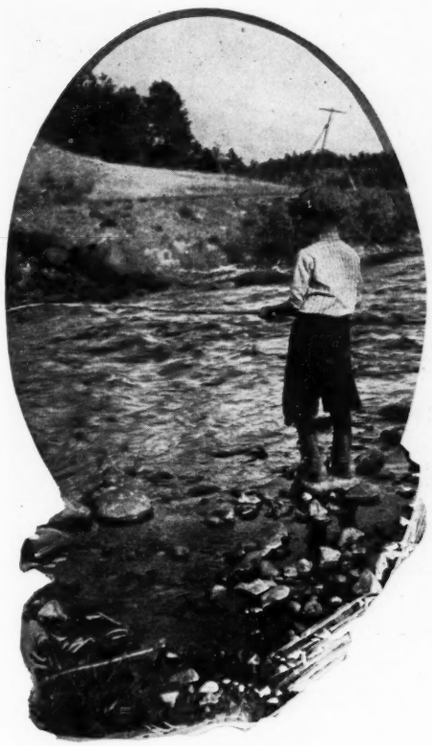
We have toured via most of the known methods—hotel, hotel and tenting combined, tenting exclusively and even that rather desirable mode of dropping in on convenient relatives. But none—not one—can in any way compare with "trailing a trailer."

I think what most appeals to us about the trailer as a touring accessory is the ability to take home atmosphere with you wherever you go. That is the one big missing link in train and hotel travel. From the minute you leave home with your trailer until your return with it, like Mary's lamb, you need never give thought to that most annoying of problems "If I can only get a clean, comfortable bed to sleep in tonight," for you will have it right with you and not have to take chances of getting the one or two good rooms in the rather doubtfully clean small town hotel. What sort of privilege is there about the small town or village which attaches to the inn or lodging or hotel the inherent right to foist upon a helpless, protesting public a filthy service that would not be permitted by law in a city with health ordinances?

Shutting Out Dust

Our trailer now and then let in a little dust but not after we put an improved cover on it that effectively shut out the dust swirled about us as we rambled over country roads. The method of folding your tent over the trailer can become an aid to shutting out dust by simply taking advantage of the flat folds, making them cover some part of the more exposed bedding. Most of the trailers now on the market provide for dust-proofing; see that the one you buy takes care of this.

There may be some question as to the effect of a load tied on behind your car as compared with the effect of piling it on top of your chassis, but there is no question that the pneumatic type of wheel on the trailer is superior to the solid rubber tire or the steel rim wheel. The drag on the



With an independent trailer home, no telling how many fish you'll catch

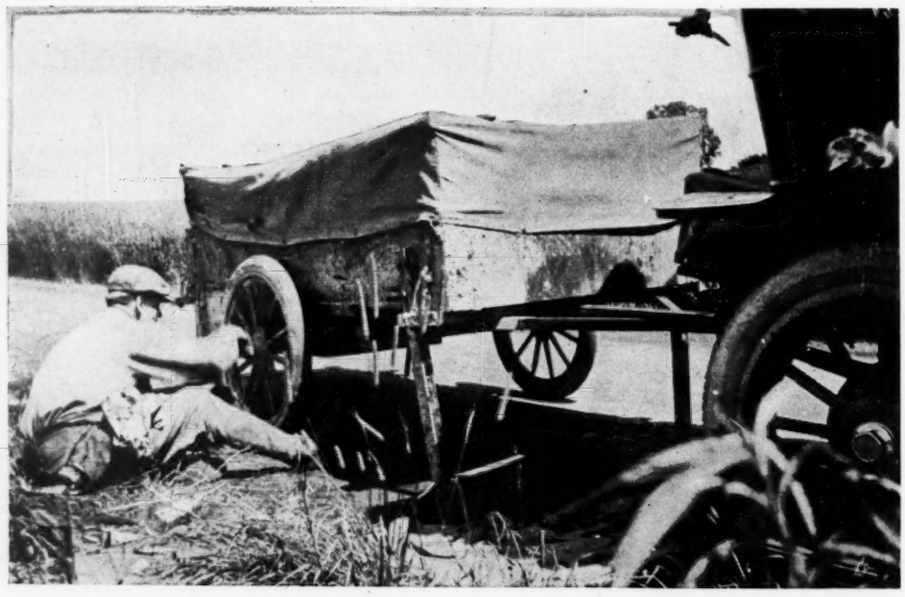
car is less with the air-filled tire; that is inevitable. There may be times when a solid tire would seem to drag less—as, for instance, in sand or deep mud—but so far as sand is concerned a slight flattening of the tires will minimize the effort required to pull a trailer through and the problem of pulling through mud is bad enough any way you put it, for any trailer will decrease greatly your traction in mud, and the best thing to do if you should get stuck in the mud is to unhitch the trailer, get your car out first, then pull your trailer at longer range than your ordinary tow-hitch. Later on in this article you will read what happened to us in this connection.

Before our trailer trip we thought that we had met all the different touring hoodoos, but we certainly met up with several of the family heretofore unknown to us. They turned up, as troubles will, just when we least looked for them and when we were enjoying a serenity and calm to which we may not have been entitled. You enjoy loping along a smooth country road, ironed out like an asphalt boulevard, tilted to the sides just enough to let the rain run off—clip off the miles at a 25- to 30-mile rate—cast a glance behind you once in a while to be sure that your trailer is still trailing you—that is trailer motoring a la perfection—bingo! something snaps and next you know you look back to see your trailer hot-footing it off to the side of the road, making most unmistakably for an innocent telephone post or gully—the trailer's coupling pole snapped off or the attachment to the car broken.

The Handy Blacksmith

Both happened to us—the order reversed—separated by a few day's space as a sort of respite. Luckily the car attachment broke within a quarter-mile of a blacksmith shop out in the middle of Missouri. And I will pause here to remark that journalists of recent years have overlooked a fine chance to write of human efficiency when the ordinary village smithy was passed by. I've met them, taken my troubles to them without any hopes of relief, put problems to their apparently limited ability that would floor trained shop mechanics, and, with a level-headedness born of necessity, they always rise to the task—and always turn out a good piece of work. At times, because your demand is for stock or material that is not to be found short of an iron warehouse, they may use a substitute material, as for instance, a back-in-the-hills smithy once made a

This was taken before food preparedness was so necessary and is not a garden anyway. The trailer will emerge with hoeing



When the trailer's wheel turned truant it got lost in a wheat field, but finally was cornered and returned to its rightful place

driving axle for me out of an old harvester shaft. Lacking a lathe he turned the round part down with a sledge and squared off the ends the same way and it worked beautifully for many a hundred-mile. The smithy to whom I handed my broken trailer-hitch went right after the task, making a stronger brace than I had on the car, using ⅝ round iron bar, which most any blacksmith shop has. It took him an hour to hammer out the ends and drill them on an old-fashioned drill press, and in a few minutes more we were on our way.

Wrong Place for Shovel

Our next meeting with the jinx was when we dropped into a hollow concealed on a deeply-shaded section of road. We heard an ominous crack when we dropped into the hollow, but an examination showed nothing but the shovel handle broken in two. Now, that shovel was fastened to the trailer tongue. Friend wife had said it was not a good place to put it, for it added a load well on to the end of the tow-pole, especially since we also piled thereon a duffle bag filled with heavy winter clothes for wear in the mountains. Though a benedict of eleven years standing I have not learned altogether that it is safe to follow a woman's "hunch" when it comes to things mechanical—but I am fast getting the needed education. That load, superimposed upon the tongue, though perhaps not weighing over 40 lbs., in time gave so much trouble by reason of its forward position that I freely admit it was an error in judgment to let it ride there, and while my wife may be inclined to feel conceited over this admission, it is due her to confess that her opinion in the matter was correct. That shovel gave me a lot of trouble, and I soon threw it away, due to the broken handle and bent head. The next one I bought was not allowed to ride there but was dropped in behind the spare tire on the running board—an ideal place to carry a shovel.

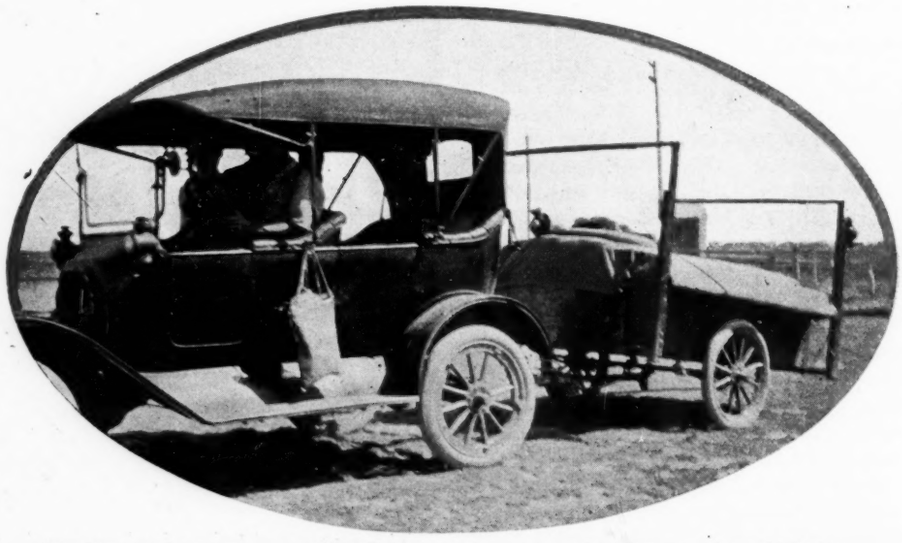
I have missed the point of the story—when the shovel broke the tow-pole also cracked in two, but since it was held by a piece of strap-iron underneath we did not notice it until a few miles later when the gradually-lowering trailer front told us something was wrong. We soon repaired it temporarily by strapping a piece of 2 by 4 underneath with web straps and tying the pole to other braces under the trailer floor with ropes. In that fashion we rode to a camping spot a few miles farther on, and, the next morning we towed the trailer safely into Kansas City, where we put into a carriage makers' shop and made a new tow-pole that has since carried us over plain and mountain and looks as though it will outlast the car. This pole is protected underneath and at the sides with heavy angle irons, firmly bolted and riveted on to the hickory pole, itself 2 by 3½ in. and running clear back to the center cross-sill under the trailer body.

This problem of trailer tow-pole, to our certain knowledge, has given much concern to many makers of these devices. It is an important question and one that should be looked into well because of its effect upon the safety not only of the trailer and its contents but of the passengers in the car ahead, for the sensation of a trailer broken loose on a mountain side, due to a weak or ineffective tow-pole or hitch, would be no joke, and an accident of this sort might have serious consequences. A tow-pole supported by side angle irons, as well as the angle irons running along the pole itself, makes a safe and certain hitch possible.

Trailer Wheel Turns Sprinter

We left Kansas City in fine fettle, creating no little sensation with our elongated load, were happily spinning on our way with little thought now of the trailer on behind, our engine fairly singing as we sped along through the wheat fields of Kansas, when a dragging sound behind brought us to a swift stop. Wonder of wonders—one of the children turned around quick enough to see the rather unusual sight of a trailer wheel, full-tired and apparently in its right senses, sail along the smooth road at a tangent, trip on a stone and vault a slight ditch with the agility of a mountain goat and then cut through the tall wheat for 50 yds. or more, leaving not even so much as an open swath to show where it had gone. This time it was a case of Henry Ford to the rescue; for that matter, the incident is chargeable to "Henry" also.

The wheels of our trailer, in common with most of the pneumatic type on the market, are standard Ford front wheels with Ford ball bearings and hubs. One of the hub-bearing cones had worn out completely, due to a loose adjustment of the bearings, and resulted in crystallizing the whole unit, the retainers and walls breaking out, leaving the wheel free to slip off the end of the axle to do a little



The friends, who drove a Ford, had a trailer too. The trailer weighed 1310 lb.

traveling of its own, relieved of its share of trailer load, and this it had proceeded to do. This was a sticker for a while, but we sensibly ate our lunch while figuring out the remedy, and the result was a roadside repair that hardly would pass muster in a correct shop practice, but as an emergency measure was not to be sneezed at. I took some odd-sized bearing balls, since the balls in the wheels were broken into bits, and packing them with plenty of grease held them in place around the axle with an old iron railroad washer picked up in the road, filed down to fit into the space where the bearing cone and retainer would go ordinarily. The end nut on the axle was not deep enough to hold the washer in, so we backed this off, as well as the adjusting nut, and put on an extra axle end nut out of my spare-parts box. To replace the missing hub cap our young son suggested we use a Thermos bottle top, held on with a piece of cloth—a perfect fit it was, too. With these repairs and plenty of oil and a stop now and then to cool off, we managed to get on to a town where we could get an entire Ford front wheel hub and bearing assembly. Incidentally I obtained an extra assembly to guard against a repetition of this breakdown, which we never had, for reasons which I shall state. The axle was badly bent, an inch or two from the end, but this I bent back with a sledge that I always carry. However, this was only a temporary expedient, for later it broke off at the point of bending.

Care of Trailer's Bearings

With a natural curiosity I made inquiry at the Ford agency about the condition which resulted in our accident and was told that such bearings should be taken up after the first 40 or 50 miles, thus giving the bearings a chance to set, and if the adjustment is made, little trouble will follow. I tried this method with the new bearings and had no further trouble. However, I watched those bearings carefully after that, making a test of the wheels by shaking them endwise every morning before starting, to locate end play. Every third day I raised the trailer axle on a jack and made the same test, occasionally finding it necessary to take up the lost motion. From my observations I have concluded that ball bearings on trailer axles call for much more attention than the bearings found on car axles. I finally took to greasing the wheels every 200 to 300 miles, filling the hub cap full of grease and squirting oil into the bearings.

It seems that a trailer load, owing to the swinging and vibration, makes a greater demand on the axle and bearings than the same load would demand if superimposed on the car itself. The effect of a trailer under certain traffic conditions, making a swift turn around a corner, for instance, or a sharp deflection from the straight line to miss a rock or road obstruction, creates a whipping motion, the extent of which depends on the speed of travel, the weight of the trailer load and the weight of the towing car. Add to these other conditions, such as the position of the load in the car and the trailer, the center of gravity, the pitch of the roadway and other lesser conditions, and you have a very complex engineering problem, one that is being studied and experimented with in many centers. If the manufacturers of trailers using ball-bearing types of axles will fasten a tag on the wheels or side of the trailer bed near the wheels, calling attention to the necessity of taking up the adjustment of the bearings after the first 50 miles or so and giving brief advice as to the subsequent care of the trailer axle bearings, a great service will be rendered to the trailing traveler and the source of much annoyance will be removed.

Looking half a mile down into the Royal Gorge from the top of the new motor road

Our experience was not a unique one as we found out afterward, for on the very day of the accident of which I have just written, in fact within the hour, we were hailed by another west-bound trailer coming, as we soon found, from our home town of St. Louis. We had drawn up for a rest after our wheel repairs and were at the moment weighing the car and trailer load at a grain scale, entirely as a matter of curiosity. Our Velie car, loaded, weighed 4400 lb. and the trailer 1040 lb. Our newly-made acquaintances also weighed their trailer and found it to weigh 1310 lb. and they were pulling it with a Ford! Shades of Henry the Great! What a great lesson in power we learned from that combination in the many days that followed, for we happily joined forces to travel the old Santa Fe trail together. As in decades gone by one prairie schooner would join another for safety against the marauding bands of redskins whose murderous crimes made a trip over the old trail a matter of peril in the olden days, so we joined forces to have good company and possibly to be sure that someone was near to help work out in common problems of the new mode of travel.

(To be continued)

Fender Law Is Illegal

Circuit Court Judge Rules Chicago Ordinance Is Unconstitutional

Fight by Truck Owners Dates Back Two Years

CHICAGO, May 14—Chicago's truck fender ordinance today was declared unconstitutional and discriminatory by Judge Fred A. Smith in the circuit court of Cook county. This closes the first chapter of a two-year record of fight by the truck owners in the city against a flagrant attempt to capitalize for private gain the efforts of the city to safeguard pedestrians.

The history of the truck-fender ordinance in this city dates from July, 1916, when the council passed a measure requiring that all commercial vehicles over 1500 lb. capacity, and not carrying passengers, must be fitted with fenders approved by a city committee. Six months were given in which to test out fenders which local concerns were making an effort to have endorsed by the police department. The chief of police refused to give his endorsement to the devices submitted. The truck owners and their organization, the Motor Truck Owners' Association, found it impossible to purchase fenders, and the association believed that the fender makers wanted the city endorsement in order to interest capital to manufacture.

Enforcement of the ordinance was deferred from time to time, and on March 16 last a temporary injunction was granted against the enforcement of the ordinance by Judge Smith. At the final hearing today, Judge Smith ruled that inasmuch as the ordinance does not include the lighter commercial cars, and those designed to carry passengers, the ordinance is discriminatroy and therefore, illegal. It is anticipated that the interests which have been behind the ordinance may attempt to have it amended.

PRICE INCREASES

Pontiac, Mich., May 11—The Monroe Motor Co. has increased the price of its car to $1,095.

Detroit, Mich., May 11—Effective May 14, the King cars will cost as follows: Roadster, $1,585; touring car, $1,650; foursome, $1,700; sedan, $2,300. Wire wheels are $100 additional.

MAKER	MODEL	OLD PRICE	NEW PRICE
Dixie	5-pas.	$ 845	$ 895
Dixie	4-pas. roadster	845	895
Dixie	5-pas. sedan	1,275	1,295
Dorris	2-ton truck	2,185	2,285

DUESENBERG TO BUILD PLANT

New York, May 14—The Duesenberg Motors Corp. has filed plans for the construction of a plant in Elizabeth, N. J., for the manufacture of airplane engines for the Government. The plant will cost $200,000. The company has been so rushed with orders that it has been forced to seek larger quarters. It has been occupying temporarily a plant at Edgewater. It is believed that the new plant will be the largest in the East, being one story, and employing more than 1000 men. The company has bought 9½ acres of land in Elizabeth.

MATHER HEADS NEW SERVICE

Washington, D. C. May 12—Stephen T. Mather, Chicago, has been appointed director of the National Park service, recently provided by Congress. Mr. Mather was assistant to the Secretary of the Interior, in which office he had supervision of the National Parks.

G. N. THURBER DIES

New York, May 15—G. N. Thurber, vice-president of the Isotta-Fraschini Motors Co., is dead from a long-standing disease of the heart. For many months he had been suffering acutely but stuck to his work. A short time ago he was forced to give up and take a rest.

RECEIVER FOR BEN HUR

Cleveland, Ohio, May 14—The Ben Hur Motor Car Co., capital, $1,000,000, incorporated in Delaware, with its factories and offices at Willoughby, Ohio, is in the hands of a receiver. Charles P. Moore, of Cleveland, has been appointed receiver. Inability of the company to obtain materials is said to have hampered its activities.

JORDAN PRODUCTION TO DATE

Cleveland, Ohio, May 11—The Jordan Motor Car Co. has shipped to date $1,700,000 worth of motor cars, and the production for the coming year is to be increased. In a statement to dealers, Edward S. Jordan, president, says on the first 1000 Jordan cars delivered to owners the total replacements from the factory amounted to $387.50. This included no replacements of parts of minor equipment.

NEW STEERING WHEEL

Wichita, Kan., May 11—The Fold-O-Lock Steering Wheel Co. is being organized with a capital of $250,000. C. A. Hagberg is president and general manager. The other officers are Carl L. Windberg, vice-president and sales manager, and F. L. Fraser, secretary and treasurer. The new wheel locks the car by folding. It is equipped with a Yale lock. Wheels for Ford cars will sell for $10, and for larger cars $15. A factory will be built. The radiator cover which the company will make is one which the driver can reach and adjust without leaving his seat.

220 Used Cars Sold

Sales at Chicago Show Total $181,345 for Nine-Day Exhibition

Successful Results Presage Continuance Twice Each Year

CHICAGO, May 14—Marketing 220 used cars in nine days at an average price of $824.30 has driven home the conclusion of Chicago dealers to conduct a used car show twice a year. When the closing hour came last night, total sales for the first used car show ever held in Chicago were $181,345. Never before has a show for used cars been held on the scale of that just completed. Everything ran as smoothly as the big national shows, principally because the show was run by an efficient show manager. There was no hit-or-miss policy about the Chicago used car show. The full co-operation of the Chicago trade was given, crystallized through the work of the show management, and there were no complaints heard throughout the exhibition.

Approximately 83,000 visited the show, 7353 of whom paid admission. It was not necessarily a bargain-hunting crowd, for an average price of $824 per car does not smack of getting cars for a song. The highest-priced car sold brought $4,300 and the lowest $275. Here is how the sales averaged each day:

DATE	CARS	SALES
May 5	15	$ 12,560
May 6	35	34,335
May 7	25	22,775
May 8	21	15,945
May 9	26	24,080
May 10	26	21,115
May 11	19	16,150
May 12	17	13,170
May 13	36	21,215
Total	220	$181,345

Tagging the car with the lowest cash price for which it would be sold, together with its pedigree as determined by an expert technical committee, proved popular with the buyers. They felt that if they bought a car they got it at a price that was the same as anyone else would have had to pay. Every dealer exhibiting voted the show a success and went to make it a semi-annual event.

JOFFRE TELLS OF BOILLET

Indianapolis, Ind., May 14—While Joffre was a visitor here he told of Boillet's death. On the return trip to the Union Station, B. M. Wylie, who had the honor of driving the National car carrying Joffre and Viviani, could not resist inquiring about his old friend Boillet and Goux, the famous French race drivers who were the speedway heroes here in 1913 and 1914. Via the interpreter, Joffre said that at the start of the war Boillet, who was a French army

officer reserve, acted as his driver and was later made a captain in the aviation service. The interpreter also knew Boillet and stated that he was indeed a hero and came to his death during an air battle in which Boillet was successful in bringing down three German airplanes. Joffre in person accorded Boillet military honors in recognition of his heroic deeds.

Boillet and Goux, representing France, were under the management ofthe National factory while in the country.

INDIANAPOLIS SPEEDWAY REFUSED

Indianapolis, Ind., May 14—James A. Allison, secretary-treasurer of the Indianapolis speedway, received a telegram yesterday from the aerial division of the United States war department stating that the speedway which recently was offered to the government as a site for an aviation training school had not been considered in the first three fields accepted, and that the Indianapolis speedway was released from all obligations to the government. Mr. Allison said he has not been informed what the objections to the grounds were and that he has no plans in view for use of the track at present.

HOWARD WILCOX MARRIES

Indianapolis, Ind., May 14—Howard Wilcox, race driver, and Miss Katherine Dugan of this city were married May 9. Mr. and Mrs. Wilcox left Indianapolis in a race car on their honeymoon, but the trip was cut short at Anderson, Ind., where the groom was arrested, fined $35 and placed in jail on the charge of speeding. After Wilcox had remained in jail for an hour he was called before the mayor of the city, who explained that his arrest was a joke, arranged by his friends. The fine of $35 was remitted to Mrs. Wilcox, and after the race driver had been host to a dinner for a score of friends, they were permitted to proceed.

OLDFIELD SPECIAL JUNE 15

Chicago, May 11—Barney Oldfield, who starts his sixteenth year as a motor car race driver this spring, will make his first appearance at the wheel of his new speed creation, the Oldfield Special, in the third annual Auto Derby to be run on the Chicago speedway June 16.

The Oldfield Special, a description of which appeared in MOTOR AGE recently, now is nearing completion on the Pacific coast. It is so constructed that it conceals both the driver and the mechanician from view and, being thickly upholstered, protects them if the car turns over.

THREE RACERS REINSTATED

New York, May 12—Eddie Hearne, Louis LeCocq and C. H. Kirkpatrick were restored to good standing with the Contest Board of the American Automobile Association at a recent meeting.

Fiats to Stay at Home

Indianapolis Race Abandoned; Racers Are Sent to Storerooms

Italian Cars Ready for Shipment When Word Came

TURIN, Italy, May 1—Securing entries for American motor races during the war period is a difficult business; building and preparing cars for these races is well nigh impossible, except for the most powerful organizations. It was in January that W. F. Bradley, MOTOR AGE war correspondent in Europe, acting on behalf of the Indianapolis Motor Speedway Co., succeeded in interesting the directors of the Fiat Co. in American races and obtaining from it a promise that two cars would be sent across the Atlantic for the 1917 campaign.

Innumerable difficulties had to be surmounted in order to complete the modified 1914 Grand Prix races. To make matters worse there were heavy snowfalls in northern Italy with the result that the cars had to be sent a considerable distance to the south in order to find roads safe for speeds of 100 miles an hour. Before the cars could be exported and before the drivers and mechanics could secure permission to leave the country a special government permit had to be obtained.

Permit was Given

After one of the most influential officials of the company had spent a week in Rome, the government decided that it would be in the industrial interests of Italy to allow two drivers and four mechanics to leave the country. When the permits had been obtained, and the cars had completed their tests, Germany put her submarine menace into effect, and for a time trans-Atlantic sailings were suspended. The railroads in Italy are as congested as elsewhere, with the result that it was doubtful if the cars could be got to the port in time for the Indianapolis race. This difficulty was overcome by a decision to load the boxed cars on automobile trucks and send them to Genoa by road. They were scheduled to leave this port end of March, and arrive in New York April 20 to 22. The drivers and mechanics booked passages on one of the French line steamers sailing from Bordeaux about April 15.

Having overcome so many difficulties, more than ordinary interested attended the dispatch of the cars from the factory to Genoa. Thus, in addition to the customs officers who attended to seal the boxes after having verified that the cars were actually racing machines, and not trucks, touring cars or war material, there were present all the high military authorities of the Turin garrison, the American consul, the heads of the various Fiat departments, and the two race drivers who were to represent Italy in the American campaign. Good wishes and congratulations were being passed around when a message boy approached Engineer Marchesi with a cable. He opened it and read:

"Indianapolis race abandoned.—Bradley."

There were a few minutes of consternation. The racing engineer looked to the chairman of the board of directors, the chairman appealed to the army officers, who shrugged their shoulders in a confused manner. Chairman Agnelli soon rapped out his decision: "We are out of this game."

WHITE RESIGNS FROM CADILLAC

Detroit, May 14—D. McCall White, chief engineer of the Cadillac Motor Car Co., has resigned. It has been reported that Mr. White has designed an airplane engine in which the government is interested and that this is the cause for his resignation. Mr. White was chief engineer of the Napier Motor Car Co of England prior to his connection with the Cadillac company.

MORE ENTRIES FOR CINCINNATI

Cincinnati, Ohio, May 12—Additions to the list of entries for the Decoration Day race on the Cincinnati speedway since last week's issue of MOTOR AGE, include Eddie Hearne, Duesenberg; Pete Henderson, Mercer; Walter Haynes, Mercer; Joe Thomas, Mercer; Louis Fontaine, Mercedes; two Duesenberg Specials entered by F. S. Duesenberg, drivers not named; one car, unnamed, entered by the De Palma Mfg. Co., and Billy Taylor, winner at Uniontown last Thursday, Stutz Special.

SPEEDWAY TO GROW TUBERS

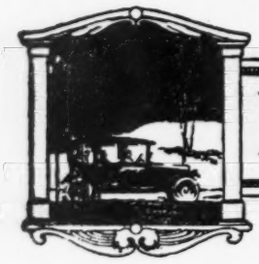
New York, May 14—The big acreage circled by the 2-mile track at the Sheepshead Bay Speedway will soon be planted with potatoes. This plan was made known today by Harry S. Harkness, president of the Sheepshead Bay Speedway Corp., who recently acquired possession of the property.

PATTERSON BREAKS RECORD

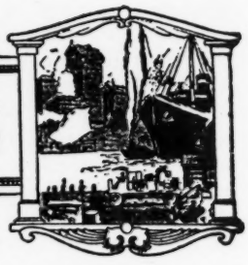
Santa Rosa, Cal., May 13—A. H. Patterson, driving a Hudson, won the first annual rose carnival classic here to-day with a time for the 100 miles of 96 min. 25 sec., breaking the track record. Bolden, in a Duesenberg, was second. Price, in a Duesenberg, was third. R. C. Durant, driving Earl Cooper's old Stutz, led for twenty-eight laps but was forced to drop out on account of magneto trouble.

UNIONTOWN PLANS NEXT EVENT

Uniontown, Pa., May 9—The Uniontown speedway officials are planning a series of local events for May 30, including a 112½-mile race for dealers and two other local events at 11¼ miles. There will be special exhibition event with a handicap race to end the day.



EDITORIAL PERSPECTIVES



Taxing Education

THE proposed changes in the second-class postage arrangements, which is a part of the war revenue measure will increase the cost of mailing business papers such as MOTOR AGE 300 per cent. This means that MOTOR AGE readers, like the readers of all other business publications, may have to help bear this increased cost. It means also that many of the weaker papers may not be able to survive the added burden.

BUSINESS periodicals such as MOTOR AGE are an essential part of any industry. They are as much a part of the industry as the organizations and societies of the manufacturing, engineering, merchandising and other departments. The United States government admits this; the government looks to the business papers for facts concerning the industries they represent and considers them a part of their respective industries. By injuring the national character of the business papers, as the proposed zone system of postage rates will do, the other industries also are injured. Each business needs its periodicals.

BUSINESS papers reach approximately 5,000,000 readers each week. This represents one out of sixteen of the adult population of the country, including males and females. From a population of 105,000,000 you have to subtract 30,000,000 for children under twelve who are not readers. These figures show what a necessity the business paper is in every industry. These figures show how entirely the various industries depend on the business papers for the dissemination of information concerning them. It is through the business paper that the men of the industry keep in touch with the different ends of the industry. Leaders in all industries admit this. They also admit that the business paper is a part of their industry; in fact, it is an institution in the industry the same as the factory, the dealer, the controlling organization, the society, etc.

A Patriotic Protest

ANNOUNCEMENTS in some of the daily papers to the effect that the motor car industry is on the verge of a collapse on account of the alleged plans of the United States government to commandeer the outputs of the steel mills and other metal working industries, as well as the proposed war tax of 5 per cent on the retail selling price of the car, are not well founded. It is doubtful if there will be any very general closing of factories or serious curtailment of output, immediately at least, on account of the government's need of material.

THE proposed war tax, however, is a most serious consideration with the car manufacturer. As was brought out last week, the Ways and Means Committee of Congress has decided that one of the revenue producing means for the $7,000,000,000 war fund is to be a tax of $5 on each $100 of the list price of a car, whether it be for pleasure or commercial purposes, and in addition, a similar tax of 5 per cent is levied upon tires and tubes.

IT is not patriotic to submit without a protest to ill-advised taxation which taxes the processes of an industry to which the government looks for assistance in successful carrying on of the war, and by such taxation injures and cripples it instead of keeping it in a healthy state. The healthier the motor car industry is, the greater war revenue will it pay the government. The motor car, truck and motorcycle industries are not unpatriotic in opposing the 5 per cent tax; they are not exempt from the taxes which fall on kindred industries and do not object to them. They will pay them with willingness; but in objecting to the 5 per cent tax they are objecting to a discriminating tax on their industries alone. Motors have become one of the necessities of war, and the motor car industry is giving freely of its services and stands ready to give more. The Ways and Means Committee does not propose to place a tax of this nature on freight transportation by railroads. It is no more logical to tax freight transportation over country highways or city streets.

Used Car Show Success

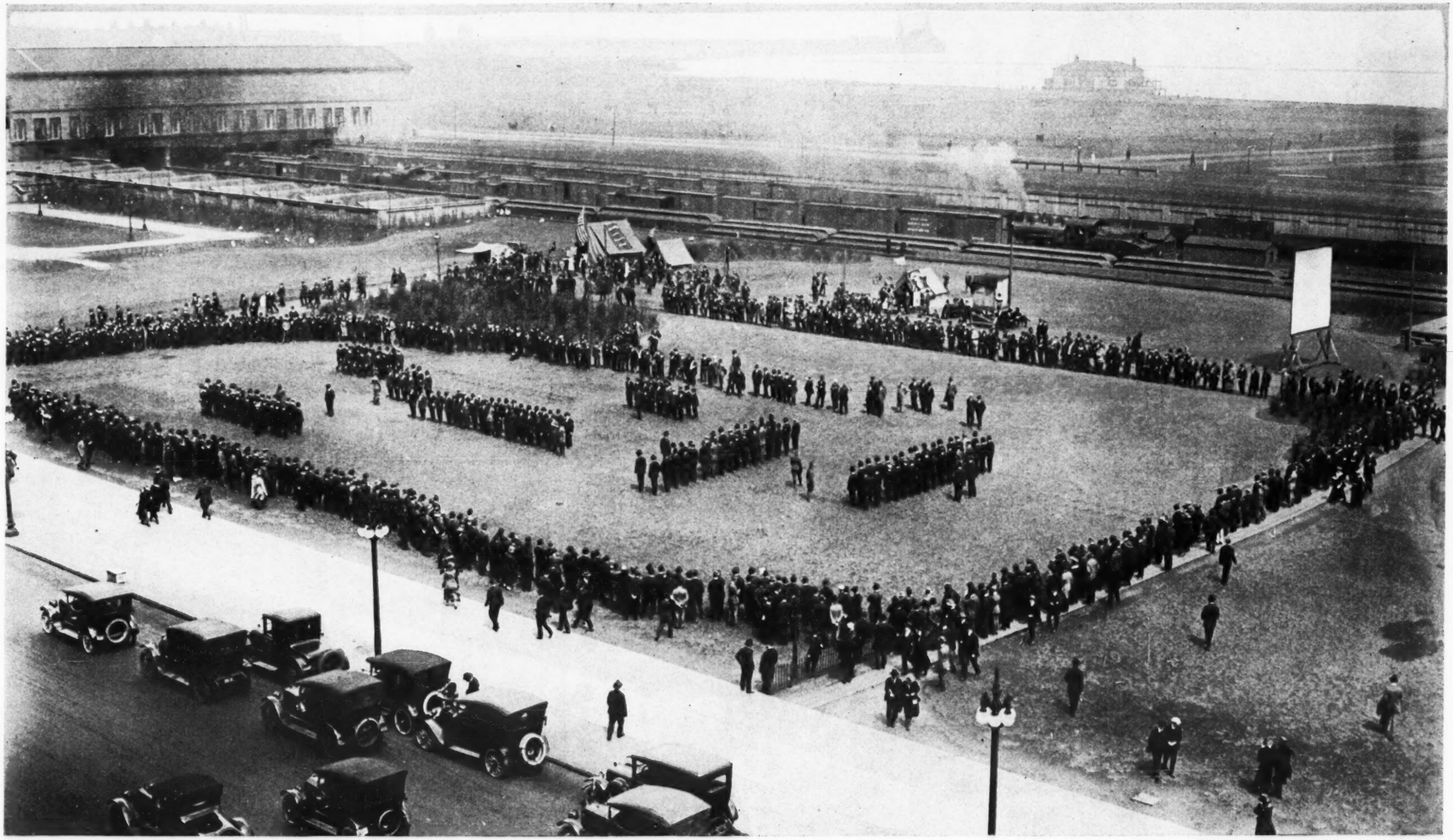
IN the Chicago used car show results are to be found the elements that make for the successful conduct of such an exhibition. Used car shows have not passed beyond the experimental stage, or at least there are many things which must be learned by motor car dealers if they are to make a success of such a method of disposing of used cars taken in part payment for new cars. That there is a market for used cars goes without saying, but selling them at a profit, even of $10 on a car, in the majority of cases is a problem which calls for a master. Out of Chicago's show, the largest so far ever held, comes these elemental factors that are necessary to successful used car shows:

FIRST—It is most essential that a competent showman handle the details of management. If you need your teeth repaired you call on a dentist—not a physician. If you find the water pipes in your house leaking you call a plumber—not a carpenter. If the dealers of a city plan a used car show they need and must get a competent show manager. They should not attempt to put a man in charge who knows little, if anything, of show management. The secretary of their association may be a good man, know the trade and be a man of initiative but he cannot know the inside of big show executive work. It is a job for an executive, and a good one, if the show is to be a success.

SECOND—Appraising cars by a competent committee and marking the sale price of every car in plain figures from which there is no deviation, gains the confidence of the prospective buyers. He fels certain that he is buying the particular car he purchases for the same money that anyone else would have bought it.

BOTH of these factors were put to test at the Chicago show and everything moved like clockwork from the opening day until the closing hour. Every exhibit was out of the Coliseum 65 min. after the show closed, which speaks for good executive work. Nine days saw 220 cars sold for $181,345, an average of $824.30 per car. Over 7000 persons paid admissions which, with the 75,000 who were given tickets, put the total attendance over 82,000.

Teaching Civilians Rudimentary Army Drill



CHICAGO'S lake front in Grant Park has become the center of military drilling for civilians. Daily the scenes here are similar to that shown above. In the center of the illustration are seen recruiting stations and the screen at the right is for moving pictures which are shown each evening to stimulate recruiting. At the extreme right is a part of the Art Institute, while at the top is the municipal pier, the Chicago Yacht Club and a part of Chicago's harbor. Grant Park has been running high in recruits daily. The effect of drilling seems to instill patriotism among the onlookers and frequently men are seen to leave the line around the drill ground, go to one of the recruiting stations and enroll to fight for Uncle Sam, liberty and the democracy of the world. The men who are being drilled have heard the call of the country and are preparing to do their bit. Have you heard the call? Are you going to do your share to keep Old Glory secure in the place it always has held in the world of freedom? Let this picture be your inspiration! If you are a real American you will not shirk your duty.

Practical Preparedness

Food Conservation

THE food question is being considered the most serious factor in the war both in Europe and America. Should the submarine campaign cut the line of boats connecting the Allies with America and other parts of the world, and so break the food line, then the Allies would be compelled to sue for peace. On the other hand food supplies are considered the most serious factor with regard to the Central powers. In the United States the food supply is looked upon as one of the most serious conditions. Armies and navies are of little avail without food. It is as important to have food as ammunition. Fighting forces need both.

ONE phase of this food conservation plan lies very close to the motor car industry through the farm tractor, which uses the explosion type of motor.

Government statistics show that there are approximately 35,000 of such farm tractors at present in use on the farms of the country. These farm tractors unfortunately are not working to capacity, and it is here that the motor car industry can exert its influence in increasing the food supplies of the country.

Statistics obtained by the Department of Agriculture, Washington, with regard to farm tractors show that the tractor is averaging forty-eight days' work a year. This figure is based on over 35,000 reports which have been received direct from farmers in every state in the Union. The average of forty-eight days' work per tractor per year is not an estimate, but a correct mathematical average.

Farm tractors instead of working forty-eight days per year should be working 150 days per year, or approximately three times as much as they are working today. Each car dealer in the country and each reader of MOTOR AGE can lend his or her influence to see that farm tractors treble the period of usefulness.

This can be done in various ways. For example: The majority of tractor owners use their machines from forty to sixty days per year on their own farms. In addition they do custom work with neighboring farmers, ranging from three to thirty days, depending largely on the size of the machine. Government statistics show that small tractors pulling two, three or four plows do very little custom work, not more than three to ten days. With larger tractors, those pulling five or six plows, the amount of custom work increases to twenty-five or thirty days per year.

THE hope of raising more crops through farm tractors rests with increasing the use of these tractors for custom work. It is questionable if there is a single farmer who cannot arrange to do custom plowing with his neighbor. This can be done in spring plowing, also in July and August plowing for winter wheat and also in fall plowing in many sections.

It has been suggested that the government would be justified in commandeering many of the existing farm tractors and requiring that they work perhaps 20 or 24 hrs. per day in the good plowing seasons if necessary. Instead of the government taking this step it might be possible for the chambers of commerce in many cities in the agricultural zones to organize themselves for the purpose of increasing farm tractor work.

Some may be wondering why this increase in crops should come more through the farm tractor rather than through the horse. One or two examples will suffice to illustrate this:

First: Take the case of winter wheat grown in Kansas and contiguous territory. Government statistics show that the greatest winter wheat yield comes from land plowed deeply in July or in early August. These are very hot months on the farm, and the farmers frequently do not want to work their horses as hard as it is necessary to do when plowing at such times.

Here is where the tractor shows to its supreme advantage, demonstrates that it is much more than a mere substitute for animal power in farm cultivation. During these months the tractor can be worked 20 to 22 hrs. per day if necessary. The tractor can plow 1 to 1½ in. deeper than it is possible for horses to plow at that time. This deeper plowing means greater winter wheat acreage. The chart shows the relative yield of winter wheat per acre on practically the same soil, but with different plowing.

DURING this period of the best winter wheat plowing, every farm tractor in the winter wheat zone should be plowing 20 to 22 hrs. per day from July 1 to Aug. 15.

The following table based on ninety-six government reports from farmers gives an indication of the number of days farm tractors are actually in use. These reports are from sections in the Mississippi valley.

Tractor	Home Plowing	Custom Plowing	Total Plowing	Estimated tractor life
2-plow	46 days	3 days	49 days	294 days
3-plow	46 days	3 days	49 days	392 days
4-plow	53 days	7 days	60 days	510 days
5-plow	40 days	25 days	65 days	585 days
6-plow	39 days	31 days	70 days	735 days

Here is another report based on a great many inquiries from owners of farm tractors in Illinois:

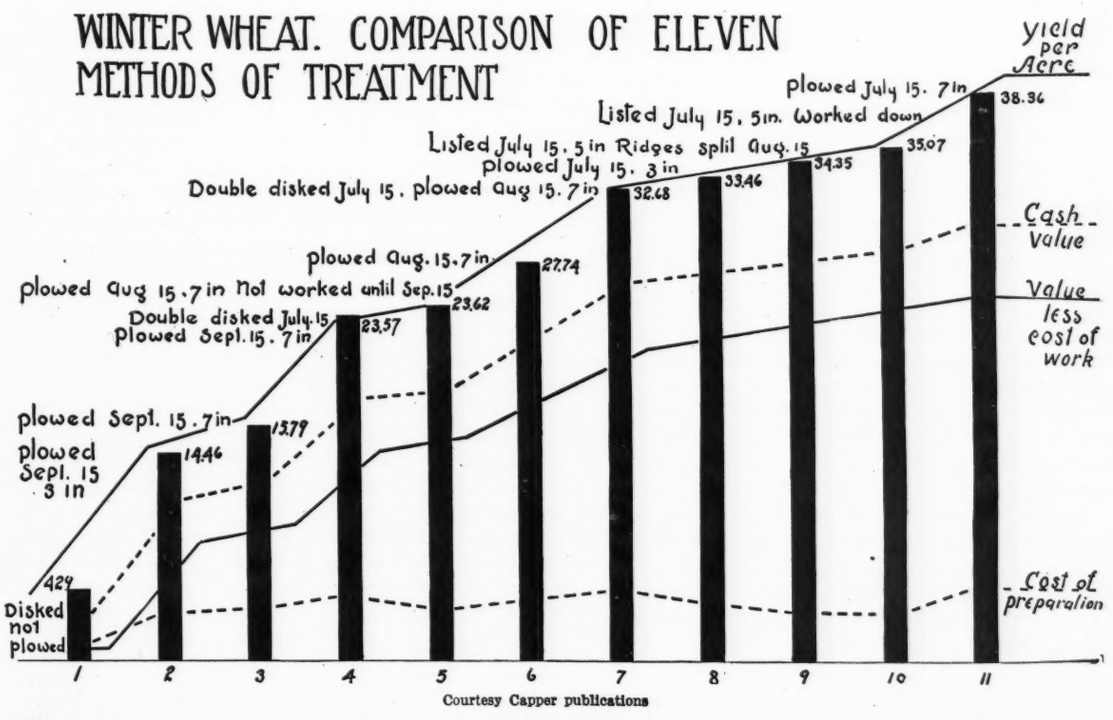
Tractor	Home Plowing	Custom Plowing	Total Plowing	Acres Plowed per day
30-60 hp.	20	21	41	20
15-30 hp.	65	57	122	14
27-45 hp.	30	..	30	13
12-25 hp.	34	3	37	10

Some conception as to the amount of work farm tractors actually performed in plowing in different parts of the country last year is given by the following tabulation based on reports from different states.

State	Number of Farmers	Total Acres Plowed
Illinois	125	42726
Indiana	61	17573
Nebraska	23	9500

IN its special bulletin on tractors the Department of Agriculture estimates that there are the following number of farm tractors in practical use in the different states. These figures do not include the total number of tractors but represent farmers owning tractors who replied to the Department's questionnaire on the work tractors were performing.

Alabama	313	Nevada	19
Arizona	23	New Hampshire	23
Arkansas	336	New Jersey	107
California	1358	New Mexico	83
Colorado	525	New York	1210
Connecticut	47	North Carolina	452
Delaware	34	North Dakota	2137
Florida	71	Ohio	1305
Georgia	543	Oklahoma	795
Idaho	262	Oregon	318
Illinois	3202	Pennsylvania	595
Indiana	1852	Rhode Island	30
Iowa	2223	South Carolina	387
Kansas	2287	South Dakota	1527
Kentucky	348	Tennessee	442
Louisiana	343	Texas	2235
Maine	53	Utah	88
Maryland	190	Vermont	75
Massachusetts	91	Virginia	434
Michigan	945	Washington	209
Minnesota	1575	West Virginia	90
Mississippi	377	Wisconsin	904
Missouri	1141	Wyoming	186
Montana	808		
Nebraska	1773	Total	34,371



Courtesy Capper publications

Making an Army Truck Driver

Qualifications You Must Have to Help Man Uncle Sam's Motor Fleet

CHICAGO, in the last week, has recruited three truck companies of thirty-two men each, one going to Fort Sheridan, one to Fort Benjamin Harrison and one to Fort Riley. Another will be sent to Fort Snelling as soon as it is recruited. These will do duty in the officers' training camps. The recruiting will continue and the men who pass will be held in reserve.

Adequate knowledge of motor truck construction and a sound body of prescribed height and weight are the two main requisites you must possess if you would have the examining lieutenant in the quartermaster's department put his O. K. on your application as mechanic or driver in Uncle Sam's motor truck fleet. Here are the general qualifications everyone must have to be accepted:

First, The applicant must be unmarried and have no one dependent upon him for support. He must be a citizen of the United States, or have made his declaration, and be able to speak, read and write English.

Second, His weight must not exceed 177 lb. or be less than 130 lb. and the weights in between these limits must be not more than 10 lb. below the prescribed weight for a given height.

Third, He must be not less than 5 ft. 5 in. tall nor more than 6 ft. 1 in.

Technical Knowledge Necessary

The quartermaster's department is very strict regarding these qualifications and any variation therefrom means rejection. The men who drive and handle army trucks must be an efficient body of men, physically, mentally and morally. The Quartermaster's Enlistment Reserve Corps seeks only "a high class of intelligent specialists * * * to render efficient service, when called, without further training." Only men between eighteen and forty-five years are taken, and they must enlist for four years. During that time they must keep themselves physically fit for military service, attend an encampment each year for a period of two weeks and present themselves for active duty at the call of the President. Truck masters are given the rank of first class sergeants, and mechanics are made sergeants. Except in emergencies the Quartermaster's Corps is not required to drill with rifles; it is like a large business concern that handles the business end of the army in time of war, or threatened war.

Application is made in the form shown herewith. In addition there must be filed two letters of reference showing the applicant to be of good moral character with particular reference to sobriety.

There are no fixed technical questions

APPLICATION FOR ENLISTMENT.
QUARTERMASTER SECTION,
ENLISTED RESERVE CORPS.

....., 191..

RECRUITING OFFICER,
.....
.....

Sir: I respectfully request permission to enlist in the Quartermaster Enlisted Reserve Corps of the United States Army, and hereby certify that the following statements are correct and are in my own handwriting:
Birthplace and date of birth.....
.....
Nativity and present residence of parents.....
.....
Height.....; Weight.....
Chest measurment:*
Expiration.....; Inspiration.....
What sickness have you had, and at what age?.....
.....
Have you been ruptured?.....
Do you drink intoxicating liquors? If so, to what extent? .....
Are you married?.....
Have you any one dependent upon you for support?
.....
Have you ever been convicted of any crime or been imprisoned in a reformatory, jail, or penitentiary?
.....
Have you attended school? If so, how long?.....
.....
Are you a member of the National Guard of any State or Territory?.....
Have you ever served in the United States Army or in any foreign army? If so, state particulars.....
.....
For what occupation in the Quartermaster Section, Enlisted Reserve Corps, do you desire to enlist?
.....
State experience you have had during past 5 years in the above line of work, giving name and address of employer .....
.....
.....
.....
....., Applicant.

*The circumference of the chest is measured by passing the tape around it at the point of the shoulder blade, the arms hanging down. The measure of inspiration is to be taken with the chest inflated to its utmost capacity, and that at expiration after the air has been expelled until the demand for inspiration can no longer be resisted.

War Department,
Q. M. C. Form No. 181.
(Authorized Feb. 21, 1917.)

listed to determine the applicant's fitness for becoming a truck driver or mechanic. The questions he will have to answer are solely at the discretion of the examining officer. Every applicant must have had at least six months' experience in driving. From his experience and general qualifications the examining officer determines much of the applicant's ability. The line of questioning in one instance may be wholly different from that in another.

Assume that you are before the officer for examination. He very likely will ask you to picture a dismantled engine and tell you to assemble it from memory. Where you begin will indicate to him whether or not you know the task given you.

Many applicants get the engine assembled and forget that they should have put in a camshaft or some other component part. Some leave out the crankshaft, others connecting rods, etc. You may be asked what you would do if you were separated from the truck convoy and found you had a broken connecting rod. You may be asked what type of engines are used in the particular cars you have driven. It is not expected that you will answer every question as an engineer would answer, but you must satisfy the officer that you know car and truck construction and can rise to the emergency if called upon to do so.

The Physical Test

If you do not come within the limits of the following table of heights and weights —stripped—it will be useless for you to apply for work in the Quartermaster's Department:

Inches	*Weight*	*Min. wt.*	*Inches*	*Weight*	*Min. wt.*
65	130	130	69½	151½	141½
65¼	130½	130	69¾	153¼	143¼
65½	131	130	70	155	145
65¾	131	130	70¼	156¾	146¾
66	132	130	70½	158½	148½
66¼	132	130	70¾	160¼	150¼
66½	133	130	71	162	152
66¾	133	130	71¼	163¾	153¾
67	134	130	71½	165½	155½
67¼	135¼	130	71¾	167¼	157¼
67½	137½	130	71	169	159
67¾	139¼	140	72¼	170¾	160¾
68	141	131	72½	172½	162½
68¼	142¾	132¾	72¾	174¼	164¼
68½	144½	134½	73	177	166
68¾	146¼	136¼			
69	140	138			
68¼	149¾	139¾			

The first thing you will be required to do in the physical test is to sort little skeins of yarn of various colors into piles according to color. This is to determine if you are color blind. Next you will be asked to stand 20 ft. from a card on which are printed letters ¼ in. high and read them, first with one eye closed, then with the other eye closed. Next you must repeat numbers whispered by the examiner 20 ft. from you. This test is given both ears. Next you remove your clothes and are weighed and measured. Remember that the table of weights given are the weights without clothing.

The next step takes you to the examining doctor, who first tests your lungs and heart with a stethoscope. Then you are asked to swing your arm violently for a few times and your lungs and heart are again tested to find the result of the exertion. Next you will be examined for hernia, then piles. You will have to satisfy the doctor that you have no venereal disease, that your joints are all in good working order, that the arches of your feet are not broken and that you are not afflicted with goiter. If you get through this examination with a good record, marks of identification are recorded and you pass.

First-class sergeants get $45 a month while serving in the United States, Hawaii, Porto Rico or the Canal Zone and $54 a month when serving in Alaska, China or the Philippines. Sergeants get $36 and $43.20 respectively in these two service divisions. Members of the Quartermaster's Enlisted Reserve Corps take precedence in each grade of said corps according to dates of their certificates of enlistment therein and

(Concluded on page 18)

Taxing America's Education

Proposed 300 Per Cent Increase of Mailing Cost Will Hit Motor Age Readers

THE WAYS AND MEANS COMMITTEE of the House of Representatives at Washington has in its war revenue measure a clause by which the postage on business papers such as Motor Age is increased 300 per cent, and in which an entirely new method of levying this postal tax has been drafted. Up to the present time, these publications pay one cent per pound postage. The new plan makes the rate 4.1 cents per pound on an average.

Under the new scheme what is known as the "zone system" is used. This zone system is the same as that used by the parcel post. The schedule of postal rates varies for the different zones as follows:

Zone 1.....2c per lb.	Zones 6 and 7....5c per lb.
Zones 2 and 3....3c per lb.	Zone 8.....6c per lb.
Zones 4 and 5....4c per lb.	

AN effort was made last Spring to institute this zone system for magazines. At that time it was known as the Randall Rider which was attached to the general postoffice bill. That was defeated. The Ways and Means Committee has announced that it is going to use all efforts to pass the present zone system—it now being advanced as a war measure.

The publishers of business papers stand ready to pay their equitable percentage of the $2,000,000 war fund needed each year. The publishers do not object, in fact are willing to pay their share, but they do object to this increase of 300 per cent on the ground that it is taxing the processes of the industry rather than the profits. The business papers are willing to pay whatever excess profit tax is necessary. They have shown their good faith in the present war by going to Washington some weeks ago and offering free advertising space to the government to aid in whatever way the government desires. This offer still rests with the government.

ONE of the glaringly unjust features of the suggested increase in postal rates is this zone system. By this system a tax on educational information is placed. The zone system places a heavier burden on the motor car owner or dealer living in Kansas City than it does in Chicago. It says that his magazines must cost him more. For the owner in Denver the cost is still higher; for Salt Lake City it goes higher; for the Pacific Coast it is highest of all.

This zone system aims directly at breaking up the national unity of the country so far as industries are concerned. Industries, like the motor car, or any other great industry, are national. They are not local to one section of the country or another. The national motor publications like Motor Age must be national in character in order to truly represent the industry. The zone system aims at destroying this national aspect of Motor Age. We are all opposed to taxation of schools, yet why does the Ways and Means Committee endeavor to squeeze an unduly high revenue out of educational business magazines which are disseminating information throughout hundreds of industries.

Motor Age asks the co-operation of its readers in combating this discriminating war tax. Like other business papers it wants to share its burden of war taxation. It is ready to meet the excess profits tax as necessary. It offers its advertising space free to the government.

BUT: Motor Age does object to war taxation which tends to cripple the business press.

The only equitable arrangement business publications can make if they are to survive under the proposed legislation is either to increase the subscription rates to *all* subscribers, or else arrange a sliding scale of varying subscription rates for subscribers in each separate zone. In either case, YOU, the subscriber, are affected by the tax.

It is to your interest, as much as to the welfare of your motor car publication, to take exception to a tax upon education. Write your Senator and Congressman—NOW! Go on record as against the proposed legislation. Elaborate to your representatives at Washington on any of the following arguments:

SECOND CLASS rates to magazines are to publications what freight rates are to railroads. Freight rates have recently been increased 15 per cent. What would happen to you, Mr. Businessman, if railroad freight rates were increased 300 per cent? An increase of 300 per cent in second-class rates is going to put many business publications out of business or reduce their profits so greatly that the government will get no income from excess profits.

Under the proposed revenue bill, publishers will pay, and are willing to pay, all taxes paid by any legitimate business, but the proposed zone basis of second class rates will constitute a special or super-tax aimed at the most vital spot in the publishing business.

The adoption of these increased rates will not produce the expected revenue. Many papers will be forced out of business. Others will suffer serious losses in circulation because expiring subscriptions will not be renewed at the higher prices, and new subscribers will be exceedingly difficult to obtain. All will undoubtedly curtail the size of their papers.

More revenue will accrue to the government from the taxes that will be imposed upon publishers' profits, incomes of employes, etc., than from an increase in second class rates that will wipe out profits and throw men out of work, not mentioning other effects.

The zone basis is inequitable and opposed to policy of democratic government. It penalizes national media in favor of local papers. It places undue exactions upon readers in distant zones. It places a discriminatory tax on the dissemination of intelligence. It is not based on true costs which do not increase in proportion to the distance. Terminal costs are the big factor.

At this most critical time, the trade and technical papers are as necessary to the government as they are to business, if we are to have the proper unity of thought and action. These established channels for the interchange of business news and counsel are but little less important than the railways.

Publishers have not participated in the high prices received by farmers, manufacturers, etc., but on the contrary have had to struggle with higher and higher costs.

It's ruinous to stop or impede the forces that create wealth to put, for example, a special tax on seed wheat, to cut down trees to get the fruit, to tear up railroads to get steel for guns. Take the eggs—don't kill the goose.

The second class matter *pays its own way* at the rate of 1 cent per pound. This can be proved. It can be proved, too, that the uniform 1-cent rate has been the greatest single influence for the spread of intelligence and the unification of all sections and classes.

Industry Fights Double Tax on Tires

Import Duty and 5 Per Cent Levy Are Proposed

NEW YORK, May 12—Heretofore crude rubber has been on the free list, but the action of the Ways and Means Committee in making an arbitrary import tax of 10 per cent on all free list articles places a double war tax on the rubber industry, in addition to the many other taxes which will fall on the industry, such as excess profits, corporation tax, income tax, freight, express, etc. The Rubber Association of America is leading the opposition to the war tax measure, which places two taxes on tires and inner tubes. These are the flat import duty and the 5 per cent tax to be paid by the manufacturer on the selling price of tires and inner tubes to dealers.

It is nothing short of sheer injustice to put a double tax on tires which are such an essential in war times. The Rubber Association hopes that at least the 10 per cent import tax will be removed. There is no crude rubber raised in this country. Rubber is one of the great essentials of war. Because of this it is hoped to get this tax removed.

The legislative committee of the Rubber Association of America consists of Frederic C. Hood of the Hood Rubber Co.; H. Stewart Hotchkiss of the U. S. Rubber Co.; and George B. Hodgman of the Hodgman Rubber Co. This committee has arranged for a hearing before the Finance Committee of the Senate.

During the fiscal year ending Dec. 31, 1916, 115,000 tons of crude rubber were imported into this country. This figure represents long tons of 2240 lbs. Crude has averaged 80 cents per pound. The present duty will be an ad valorem tax, which would make it difficult to calculate, and if such a tax eventually goes through the rubber importers would prefer something specific rather than an ad valorem one.

FORD INCREASE PROBABLE

Detroit, May 16—Special telegram—The Ford Motor Co. is notifying its dealers that an advance in price may be necessary in the near future. Orders now on the books as unfilled amounting to 100,000 cars will be filled at present prices. The dealers have been notified that all orders from this time on are subject to advance in price and that delivery to consumers must be subject to price advance if the Ford company increases its price any time. An increase may be necessary some time in the near future because of rapidly increasing costs of materials, and this step is protection for the Ford company on future business.

MAY NOT DRAFT TRUCK WORKERS

Detroit, May 11—Word has been received from Washington that a special section will be left in the selective draft bill, now being prepared by the senate and house committee for the president's signature, which will exclude from field service those workmen who on account of their mechanical skill will be of greater value in the manufacture of airplanes, motor trucks and munitions of war.

NOT ENOUGH AIRPLANES

Washington, D. C., May 11—Howard E. Coffin, in addressing the recent conference of governors of states held here for consulting with government heads as to plans for national defense, made the statement that this country will need more airplanes than it possibly can produce. Mr. Coffin also said that he believed it never would become necessary in this country to commandeer private motor cars because more cars were manufactured in the United States than the country could use even in time of war.

Touching the possible use by American troops that may go to France of implements of war, Mr. Coffin said that these troop will have to use allied guns and munitions. He explains this by the statement that the Allies are manufacturing more munitions than they can use and, therefore, could help supply American soldiers sent to assist them.

Battery I of the First Motor Battery, New York National Guard, in action during maneuvers near Fort Washington Park

MAKING ARMY TRUCK DRIVERS

(Concluded from page 16)

when called out for training or for actual service take precedence next below all other enlisted men of like grades in the regular army.

Railroad fare is paid from their homes to the places ordered, when called for actual service, and return to their homes; an allowance of 50 cents per meal while traveling is paid by the Government. No retirement or retired pay is allowed, nor will a pension be given except in case of physical disability incurred while in actual service or while traveling under orders.

All applicants must pay their own expenses to the place of enlistment. Branches of the Central Department are maintained in the principal cities of the fifteen states embraced in the Central Department of the army. This is true of the Eastern, Southeastern, Western and Northwestern Departments.

FOUNDER OF INDUSTRY DIES

Detroit, May 11—Samuel L. Smith, founder of the motor car industry in Detroit, died this week.

Mr. Smith established the Oldsmobile company sixteen years ago in Detroit, and was the first manufacturer to produce thousands of motor cars annually. He was the discoverer and explorer of the commercial possibilities of the motor car, and he had the courage to spend millions of dollars on the industry in the earliest days when all others were dubious of its future. In 1902 he produced 4000 motor cars with a net profit of $210 per car, and astounded the industrial world. Practically all the leaders of the industry to-day were affiliated with, or were given their first impetus by, the original Oldsmobile company.

MAURICE E. BLOOD DIES

Kalamazoo, Mich., May 9—Maurice E. Blood, identified with the construction of motor cars and parts since 1900, died at his home here last night. He was 66 years old. In 1900 he left the bicycle business to become manager of the Michigan Automobile Co., and in that year and the year following 150 narrow-tread cars were constructed.

In 1902 he united with his brother in the organization of Blood Bros. Machine Co., then of Kalamazoo and now of Allegan, Mich. In 1903 he invented the universal joint which is now being manufactured in practically the original form.

Blood Bros. Machine Co., under the management of the late Maurice E. Blood, increased its capitalization from $500 to $75,000 in eleven years of business without a single call for outside capital. He is survived by the widow and two sons, Howard E. Blood of Detroit and Wallace B. Blood of the MOTOR AGE staff.

NEEDS 33,000 TRUCK BODIES

Chicago, May 14—Practically all the large manufacturers in the middle west of motor truck bodies, wagons and other army train equipment were called to a conference at the La Salle Hotel last week to learn the needs of the armies for the first few months of the war. The government officials gave as one of the items 33,000 motor truck bodies. The total of value of all the supplies wanted approximates $40,000,000.

E. E. Parsonage of the John Deere Co., Moline, Ill., was chosen chairman of a committee to determine the capacity of the various plants, and it was decided to apportion the vast contracts among the manufacturers in such a way as to interfere as little as possible with regular business.

INDUSTRY'S MEN OFFER AID

Horace E. Dodge of Detroit has offered his 180-ft. private steam yacht Nokomis I. to the navy department for use as a coast patrol cruiser. The Nokomis I. is valued at $250,000.

Frank M. Langdon, assistant advertising manager of the Cadillac Motor Car Co., has reported at Ford Sheridan, Ill., for training in the officers' corps.

W. O. Briggs, president of the Briggs Mfg. Co., has enlisted in the army and will serve in the special service department.

M. A. Smith, mechanical engineer Standard Oil Co. of Indiana, who has been reserve officer in the infantry, has become first lieutenant in the Marine Corps, taking active service on the first day of the war.

Alma, Mich., May 8—Marcus Pollasky has tendered the Republic Motor Truck Co. plant at Alma and its subsidiary, the Torbeson Axle & Gear Co., at Cleveland, to the government for operation without profit in any way that may be needed. Mr. Pollasky has also announced that he is ready to raise personally a regiment of 1220 men in Gratiot county, Michigan, which he would lead for service.

Savannah, Ga., May 12—John G. Anderson of Rock Hill, S. C., is in Washington, and has tendered the government the use of his entire buggy, wagon and motor-making establishment for its use on a 10 per cent basis.

In Protest Against 5 Per Cent Tax

Industry Gets Half Hour for Defense Before Senate Committee

WASHINGTON, D. C., May 14—With only half an hour alloted the motor industry in which to defend itself against the proposed 5 per cent tax, the Senate finance committee was shown forcefully Saturday afternoon that the war revenue bill will fall down completely as an effort to raise $75,000,000 for the reason that instead of producing revenue the 5 per cent tax will kill the business.

It was pointed out to the Senate committee members that the proposal is not only unfair and discriminatory but that it will also, along with failing to bring the expected revenue, result in untold benefits to the ten or dozen companies that can stand the tax, kill off the 435 other companies that cannot stand the impost and result finally in some such monopoly as the Standard Oil.

Car manufacturers gathered from all parts of the country to present their case, but when they found how limited their time was to be they turned the presentation of their case over to Alfred Reeves of New York, general manager of the National Automobile Chamber of Commerce.

The average profits on sales for the industry as a whole, Mr. Reeves said, are between 10 and 12 per cent. Imposition of the 5 per cent tax instantly reduces this average to from 5 to 7 per cent, and this takes in the very prosperous companies. Most companies average below 10 per cent on the car, and some of the oldest companies do not even make 6 per cent. On those companies the tax would be confiscatory. The very discussion of this tax and the fear that it is going to be imposed has already resulted in cancellations of orders running into the millions.

Dr. E. C. Crow, one of the original partners of the Winton Co., Cleveland, Ohio, said:

"With all our experience and economies in manufacturing, we cannot afford to pay this 5 per cent tax and come out on the right side of the ledger.

"In 1914 our business amounted to $3,800,000 and our profit was 6 per cent. In 1913 we did a business of $5,000,000 and made 3 per cent. Last year, with a $9,000,000 business, our net profit was 4.4 per cent. There are hundreds of companies that cannot afford to go up against this tax, but there are a few that can, and they will absorb the tax and acquire a monopoly."

Senator McCumber, of North Dakota, showed a genuine appreciation of the situation by bringing out the fact that no imposition of burden can be placed on such a competitive industry without disturbing the whole structure. He asked: "Isn't it true that a lot of the medium-priced cars are having difficulty selling their cars against the competition of the cheaper ones?" and that being answered in the affirmative, he continued: "Is it not true that imposition of this tax will either compel the medium-priced manufacturer to absorb the tax or else succumb to the competition of the cheaper car?" The Senator was assured that it meant ruin either way.

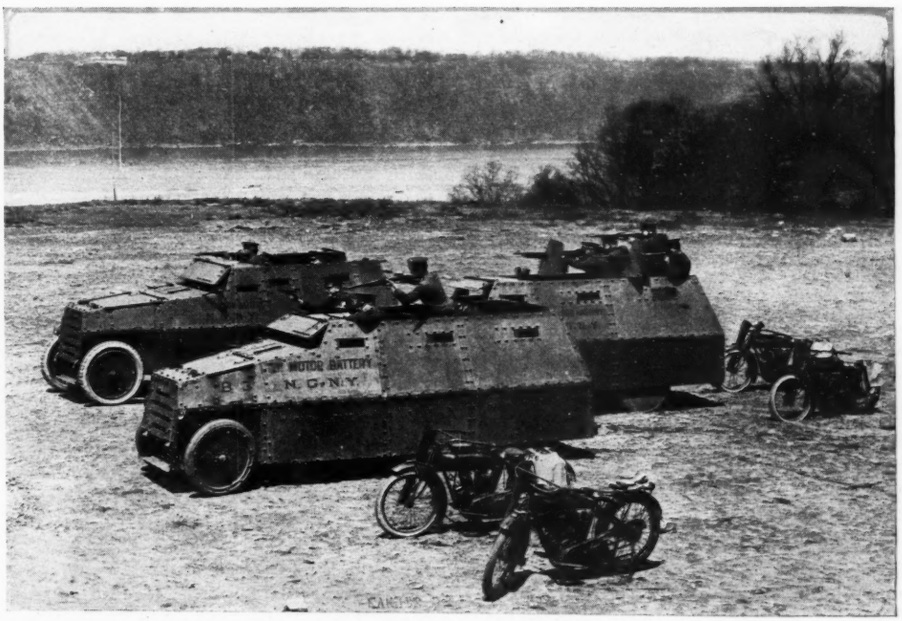
At the meeting held Friday night by the car manufacturers the proposition was broached to ask Congress in lieu of this 5 per cent sales price tax to impose on the industry an excess profits tax over and above the exempted 8 per cent of 20 per cent.

The war revenue bill is going to increase the existing excess tax from 8 to 16 per cent. The motor car men's idea is that if the government wishes to single them out for additional burden should take the form of an extra-excess tax rather than a tax on sales.

This suggestion will be made to the House of Representatives—if the motor car men agree to it—and will be presented by one of the Michigan members as an amendment. Congressmen Doremus and Kelly, of Detroit, are preparing for a vigorous fight on the House floor when the motor car section is reached.

603 MILES IN TRAFFIC

Grand Rapids, Mich., May 12—Paul Gee, Chalmers distributor, this city, recently drove a Chalmers seven-passenger touring car 603 miles in and around Grand Rapids in 24 hrs. The car was locked in low and intermediate speeds, giving the driver access only to high and reverse gears. Three newspaper men, American Automobile Association representatives, checked all the details. An official stamp was placed on the seal binding the gears, and the gaso-



Three units of the First Motor Battery, N. Y. N. G., took part in recent maneuvers. This is fighting formation for actual battle

line tank was filled and sealed. The start was made from the Chalmers service station in Grand Rapids. No set course was followed, the car going through the traffic up the heavy grades of the city and through the outskirts. Paul Carlton, a Chalmers salesman, relieved Gee at the wheel, and during the major part of the afternoon and evening four other persons were passengers. At 8 p. m. the day of the race a stop was made for gasoline and checked. The average consumption of gasoline was 13.2 m.p.g. This was low test gas.

JORDAN ADDS SPACE

Cleveland, Ohio, May 11—The Jordan Motor Car Co. has increased the capacity of its plant by taking over 20,000 sq. ft. in an adjoining factory building of the same construction, so located that it becomes virtually a part of the Jordan plant.

ALVORD HEADS WRIGHT-MARTIN

New York, May 11—John F. Alvord has been elected president of the Wright-Martin Aircraft Corp. Mr. Alvord is at present president of the Hendee Mfg. Co., and it is understood that he is to retain that position in the future, as well as serving as president of the Wright-Martin Co.

FOREIGN AGENT HERE TO BUY

Chicago, May 14—J. B. Clarkson of New Zealand will be in Chicago this week and in New York from May 21 to June 2 on his annual business visit to the United States. Mr. Clarkson is managing director for Hope Gibbons, Sons & J. B. Clarkson, Ltd., wholesale merchants at Wellington, N. Z. He will buy motorcycles and motor car accessories for his firm while in this country.

HESS-BRIGHT AND S K F FUSE

New York, May 11—In line with plans made last autumn when New York interests, including the National City Bank and Brown Bros., New York, who were interested in the S. K. F. Ball Bearing Co., also acquired an interest in the Hess-Bright Mfg. Co. of Philadelphia, the S K F Administrative Co. has been formed to administer the affairs of both companies.

The board of the new company includes Frank A. Vanderlip, president of the National City Bank; Thatcher Brown of Brown Bros.; F. B. Kirkbride; S. Wingquist; Axel Carlander; Marcus Wallenberg, a banker of Sweden, and B. G. Prytz, who as president of the S. K. F. Ball Bearing Co. has been active in bringing about the fusion between the two companies. Mr. Prytz has been elected president of the administrative company. Budd D. Gray of the Hess-Bright company resigned as president, and will become technical advisor of the company. The manufacturing facilities of both the Philadelphia and Hartford plants will be extended.

Muncie Workers Strike

Motor Industry of City Halted by Demands of Laborers

Some of Men Return to Work Without Settlement

MUNCIE, IND., May 13—Labor troubles, the worst that have ever beset the Indiana motor car industries, have paralyzed the motor car and parts manufacturing plants of this city. At least 3000 machinists are on strike, demanding a 20 per cent increase in wages, recognition of the machinists' union, time-and-a-half for overtime, an 8-hr. day, double pay for Sundays and the re-instatement of discharged employees who were agitators.

The companies affected are the T. W. Warner Auto Parts Co., the Inter-State Automobile Co., the Warner Gear Co. and the Muncie Gear Co. The strike started in the plant of the T. W. Warner Auto Parts Co. Monday evening, May 7, when more than 600 men walked out. Although a few workmen and the office force remained loyal, it was necessary to close the plant. T. W. Warner offered the men a 25 per cent increase in wages, although they asked only 20 per cent. About half of the employees had returned to work Saturday with the understanding that the union was not to be recognized. Officials of the company announced that all departments of the plant would be in operation this week.

A total of 700 men, mostly machinists, went on strike at the plant of the Inter-State Automobile Co. After the strike had spread to this plant, the company made strenuous efforts to persuade the men to return, although no promises were held out. Less than 200 of the strikers had returned to work Saturday.

All the employees of the Warner Gear Co., numbering about 1,200 men, went on strike, and the plant was closed. Less than 200 of the men had returned Saturday, and no settlement was in sight. The plant of the Muncie Gear Co. is closed, following a walk-out of employes. Officials of the company have refused to discuss a compromise with the men, saying they have no inducements to offer. The company has been compelled to cancel several large orders. It already has sustained a large loss.

RANCHER INVENTS TRACTOR

Detroit, May 11—William Turner, ranch owner of Washington, has invented a new tractor, which has been demonstrated successfully on his western farms. The tractor weight is distributed evenly on two large driving drums, which oscillate and enable the tractor to cover uneven surfaces of ground. It is constructed with a low center of gravity to allow it to be driven on side hills without turning over. It is driven by a gasoline engine and has a large platform for carrying heavy loads of farm products. It will turn in its own area.

The tractor is to sell at a price around $1,000. Its chief advantage is said to be that it carries all weight close to the ground and can negotiate easily side hills. The drums are 2½ ft. wide and 4 ft. high. The tractor operates by an inside hub transmission which travels a track lining the drum and forces the drum to revolve. The weight is 3500 lbs. Total width over all is 8 ft. Mr. Turner has not decided definitely on the price or how he will market the tractor.

MARMON SELLS BRANCH

New York, May 12—The Marmon branch in this city has been sold to the Marmon Motor Co. of New York. This company is a new organization with T. B. VanAlstyne, formerly advertising manager of the Class Journal Co., as president; F. G. Carrie, former manager of the Marmon branch, as secretary, and Charles Larson, one of New York's most successful dealers, now handling the Oldsmobile, as treasurer.

CHALMERS MAKES MILE IN 38.1 SEC.

New York, May 11—What is considered a new mile straightaway record in the 161 to 230 cu. in. class was made May 4 by a Chalmers stripped stock chassis at Pablo Beach, Jacksonville, in 38.1 sec., or 94.48 m.p.h. The car was driven by Joe Dawson, who recently joined the Chalmers company to carry on the new series of tests. The car was driven minus its fan. The gear ratio was 3½ to 1.

WILLYS-OVERLAND ELECTS

Toledo, Ohio, May 12—John M. Willys was again elected president of the Willys-Overland Co. at the annual meeting of the stockholders this week. Other officers are: Vice-presidents, C. A. Earl, H. L. Shepler, Isaac Kinsey, James E. Kepperley and Edwin B. Jackson; secretary, Royal R. Scott; treasurer, Frank K. Dolbeer. The directors are John N. Willys, Edward J. Swift, H. T. Dunn, C. A. Earl, H. L. Shepler, Rathun Fuller, James E. Kepperley, Frank K. Dolbeer and Royal R. Scott.

W. H. TURNER DIES

Denver, Col., May 11—William H. Turner, race driver, has died in Denver after an illness of several months. He was known throughout the Rocky Mountain region as "Wild Bill" Turner, a title of admiration and affection given him because of performances as a race driver. He held the record for the Mount Falcon hillclimb, a foothills event conducted by the Denver Motor Club near Morrison, and also had won several road and track racing prizes. He was prominent in trade circles as Wyoming district salesman for the Maxwell, which position he held at the time of his death.

Taylor Wins at Uniontown

Dark Horse from Coast Takes 110-Mile Race at 89.25 M. P. H. in Newman-Stutz

UNIONTOWN, Pa., May 10—Billy Taylor, well known Los Angeles road race driver, won the 112-mile Universal Trophy race in a Newman-Stutz on the 1⅛-mile board speedway at Uniontown to-day. His time was 1:15:38, averaging 89.25 m.p.h. Victory was fairly snatched from the grasp of Chevrolet in a Frontenac when he stopped to change a plug in the eighty-first lap. Taylor, taking advantage of his opportunity, jumped into the lead and maintained it to the finish without making a single stop at the pits during the race. Chevrolet's teammate, Boyer, crossed the tape for second price, with Hearne in a Duesenberg leading Chevrolet, last year's winner, whose unfortunate plug trouble threw him back to fourth place despite daring driving during the closing laps of race, when his Frontenac attained a speed of more than 105 m.p.h.

Dealer Winners Duplicate

The dealers' race was almost similar to last year's event so far as order of finish went, Fetterman's Peerless capturing premier position in 1:21:34.8 or 82.74 m.p.h., with McCarthy second, although this year McCarthy's mount was a Haynes instead of a Murray. Third place, however, went to a Murray with Wynn at the wheel, followed by Robinson's Haynes and Hudoe's Buick, leaving one prize unawarded.

Fountain's Mercedes was first to be eliminated in the Universal Trophy race, retiring on the thirty-ninth lap with a broken camshaft.

Burt in an Erbes broke a driveshaft in the fifty-fourth lap, and Vail's Hudson went out in the seventy-first lap with a burned-out coil.

In the dealers' race Stuller's Maxwell broke a connecting rod and limped to pits on the twenty-fourth, out of the race.

Monahan's Packard Six succumbed to engine trouble in the seventy-first, and McFarland in a Murray was ruled off the course in the ninety-seventh lap for foul driving.

The Universal Trophy for the 10-mile event at Uniontown won by Taylor with a speed of 89.25 m.p.h.

The crowd is estimated at more than 20,000. It enthusiastically cheered the favorites in both races. Approximately 1000 motor cars of all types and sizes were packed in and about the track and hillsides and the coal trestles overlooking the track were crowded with spectators who were not inclined to swell the gate receipts. A large surplus was available for the speedway treasury after all expenses had been paid. Receipts from the infield alone totaled $30,000, and the estimated total of $20,000 from grandstand and box seats indicate gross receipts of $50,000.

Weather conditions were fair, although far from ideal for racing, as a cold wind was blowing and the light was trying, due to alternating cloudiness and sunshine. During the intermission between the two races DeLloyd Thompson made an airplane flight, looping the loop several times.

Chevrolet Takes Lead

Chevrolet took the lead in the Universal Trophy race from the start, although he was followed closely by Vail, de Palma and Oldfield. De Palma was the first to feel the strain, going to the pits in the eleventh lap to change a left rear tire, thus forfeiting third place to Oldfield, who blew a tire in the twenty-fourth lap, leaving Vail and Chevrolet still battling for first place. In the thirty-second lap Vail met tire trouble, repeated in the thirty-fifth, practically putting him out of the running. Oldfield made a determined effort to get into first rank but was unable to overtake either Chevrolet or Vail. He lost a precious 90 sec. cooling a universal joint overheated by the pace to which he was pushing his mount.

While these brushes were going on Taylor was shooting his Newman Stutz around the course at an even, consistent pace without stopping at pits but keeping fairly close to the leaders all the time. About the eightieth lap Chevrolet's Frontenac began to miss, and on the eighty-fifth lap he was obliged to make his costly stop to change

Start of Universal Trophy race at Uniontown last Thursday. Twelve of the fifteen racers to start finished the 110 miles

Order of Finish in Uniontown Races

UNIVERSAL TROPHY

Newman-Stutz, Taylor	$3,000
Frontenac, Boyer	2,000
Duesenberg, Hearne	1,000
Frontenac, Chevrolet	900
Hoskins, Lewis	800
Johnson, Klein	700
Pugh, Meyer	600
Hudson, Mulford	500
Oldfield-Delage, Oldfield	300
Olsen, McBride	200
Packard, DePalma	
Crawford, McCord	

Eliminated—Mercedes, Fountain, 39th lap, broken camshaft; Hudson, Vail, 71st lap, burned out coil; Erbes, Burt, 54th lap, broken driveshaft.

DEALERS' RACE

Peerless, Fetterman	$750
Haynes, McCarthy	500
Murray, Wynn	400
Haynes, Robinson	300
Buick, Hudoc	200

Eliminated—Maxwell, Stuller, 24th lap, broken connecting rod; Packard, Monahan, 71st lap, engine trouble; Murray, McFarland, ruled off course in 97th lap for foul driving.

plugs. Taylor grasped his opportunity and whirled to the lead, keeping his advantage despite Chevrolet's frantic efforts to overtake him.

Pit stops were numerous, de Palma stopping four times for tire and engine trouble; Vail's Hudson stopped three times. Chevrolet's Frontenac, Oldfield's DeLage, Lewis' Hoskins and McCord's Crawford all stopped twice. Mulford's Hudson, Boyer's Frontenac and Meyer's Pugh each stopped once. Vail performed a daring bit of driving near the start of race, when he blew a tire on the southeast curve of track. His Hudson was near the top rail at the time and started for the inner rail of the saucer, but within a few feet of the barrier Vail managed to swing it about and shot into the pits.

When Taylor crossed the tape a winner, Mulford was in his ninetieth lap, Oldfield was on his eighty-ninth, de Palma his seventy-ninth and Vail his seventy-first.

For the first 50 miles of the dealers' race Monohan in a Packard Grayhound and McFarland's Murray fought for lead in a give-and-take race which several times brought spectators to their feet with a burst of cheers. Both cars were forced to undergo severe punishment as their drivers urged them to maximum speed almost from the start till the Packard began to miss and succumbed to engine trouble in the seventy-first lap. Soon after this Fetterman in the Peerless got the signal to sprint and opened his throttle till he was far in the lead with only McCarthy's Haynes to dispute his title to victory, McFarland in a Murray having been ruled off the course by Referee Ricker in the ninety-seventh lap for foul driving. The Peerless had been lying back all through the race, being content to keep in the same lap with the leaders without running any chance of a strain which might mean elimination. As soon as the Packard and Murray had worn themselves out in the struggle for leadership, Fetterman shot into the van and maintained his advantage.

In the tenth lap Wynn's Murray was leading with his teammate McFarland close behind. Fetterman came third, and Hudoc's Buick fourth with Monahan fifth, Robinson's Haynes sixth, and Stuller's Maxwell seventh.

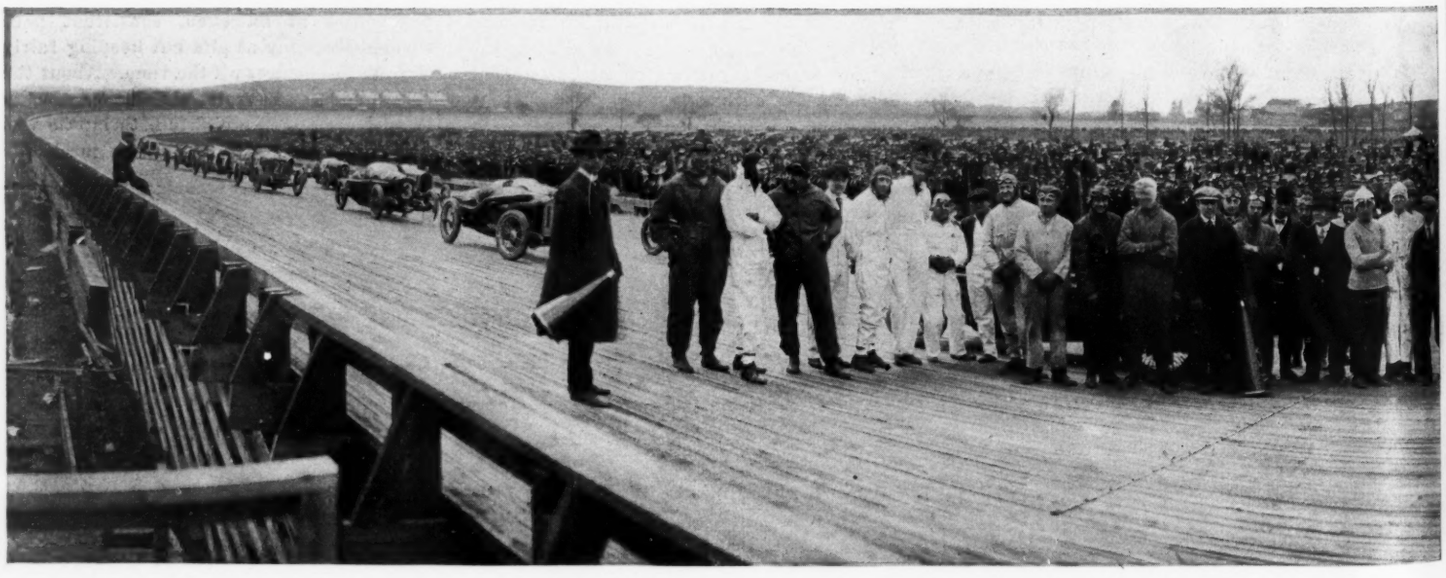
During the fifth twenty laps the cars averaged 81 m.p.h.

Shortly after this battle between the Packard and Murray began, and for the first fifty laps, McFarland had made a record of 41:15.6 with Monahan's Packard only $\frac{4}{10}$ sec. behind him. At the sixtieth lap McFarland's lead was 7.2 sec., and it was at this point that the Packard began to miss. Fetterman's Peerless took the lead

EQUIPMENT OF CARS IN UNIVERSAL TROPHY RACE ON UNIONTOWN SPEEDWAY, MAY 10

CAR	DRIVER	BORE	STROKE	DISP.	CARB.	IGNITION	PLUGS	NO. PLUGS	NO. VALVES	VALVE LOCATION	TIRES	WHEEL-BASE	WHEELS	PISTONS	OIL
Frontenac	Chevrolet	3 7/8	6 3/8	299.9	Zenith	Bosch	A. C.	8	16	Head	Goodyear	104	R. W.	Miller	Oilzum
Hudson*	Vail	3 1/2	5	288	Hudson	Delco	A. C.	6	12	Right side	Goodyear	105 1/2	R. W.	Magnalite	Oilzum
Hudson*	Mulford	3 1/2	5	288	Hudson	Delco	A. C.	6	12	Right side	Goodyear	105 1/2	R. W.	Magnalite	Oilzum
Hoskins	Lewis	3 3/4	6 3/4	298.2	Miller	Bosch	Rajah	8	16	Hor. in head	Goodyear	105	R. W.	Magnalite	Oilzum
Mercedes	Fountain	3 7/10	6 1/2	279.6	Mercedes	Bosch	Special	8	16	Head	Goodyear	112	R. W.	Magnalite	Monogram
Frontenac	Boyer	3 7/8	6 3/8	299.9	Miller	Bosch	Rajah	8	16	Head	Goodyear	104	R. W.	Miller	Oilzum
Packard**	De Palma	2 3/4	4 1/2	299.2	Zenith	Delco	Rajah	12	24	Head	Goodyear	112	R. W.	Magnalite	Monogram
Olsen	McBride	3 3/4	6 3/4	298.2	Miller	Bosch	Splitdorf	8	16	Head	Silvertown	107	R. W.	Magnalite	Mobiloil
Erbes	Burt	3 5/8	7 1/8	294.2	Miller	Bosch	KLG	4	16	Head	Silvertown	98	R. W.	Miller	Oilzum
Newman-Stutz	Taylor	3 1/8	6 1/2	296.8	Miller	Bosch	A. C.	4	16	Head	Goodyear	102	R. W.	Magnalite	Oilzum
Duesenberg	Hearne	3 3/4	6 3/4	298.2	Miller	Bosch	Rajah	8	16	Hor. in head	Goodyear	106 3/4	R. W.	Magnalite	Oilzum
Pugh	Meyer	3 3/4	6	298	Master	Bosch	Rajah	8	8	Hor. in head	Silvertown	108	Houk	Magnalite	Mobiloil
Oldfield-Delage	Oldfield	3 5/8	7	289	Miller	Bosch	A. C.	8	16	Head	Firestone	104	R. W.	Miller	Oilzum
Johnson	Klein	3 3/4	6 3/4	298.2	Miller	Bosch	Rajah	8	16	Hor. in head	Silvertown	100	R. W.	Magnalite	Mobiloil
Crawford	McCord	3 3/4	6 3/4	298.2	Master	Bosch	Rajah	3	16	Head	Goodyear	106	R. W.	Magnalite	Mobiloil

*Six-cylinder; **Twelve-cylinder aviation type engine; all other cars have four-cylinder engines. All cars equipped with Boyce Moto-Meter; all equipped with Hartford shock absorbers except Fountain's Mercedes, which has Mercedes type.



The line-up before the races at Uniontown Thursday shows several things, chief among which is the way in which the speedway management had erected a safety rail at the turns

soon afterward and kept it. As only eight cars started in this race there was comparatively little pit trouble, Stuller's Maxwell being the first to stop, for a right rear tire in the eleventh lap and again in the twenty-fourth, when it went out with a broken connecting rod. The Packard made three stops before giving up the struggle, due to engine trouble.

I. P. Fetterman, winner of the dealers' race, driving Peerless

FLINT MAKERS TO EQUIP UNIT

Flint, Mich., May 10—Organization and equipment of a motor ambulance unit will be undertaken by the Flint Manufacturers' Association, according to an announcement to-day by J. D. Dort, chairman of the committee appointed for the purpose by C. S. Mott, president of the Flint chapter of the Red Cross. Dr. J. G. R. Manwaring, James Parker, H. H. Bassett and W. R. Hubbard are the other members of the committee. It is proposed to recruit and equip the company entirely in Flint, building the ambulances in the local motor car factories.

NEW ROAD THROUGH OIL FIELDS

Ringling, Okla., May 11—The first permanent highway from Ringling to the recently discovered Fox Pool of the great North Ringling oil field is being built. This highway, as far as oil fields are concerned, has no equal in importance in Southern Oklahoma, for the Fox Pool is in the midst of a rough timbered country that until recently was practically roadless. Development so far has cost more than $500,000, and more than half this was for wagon transportation of supplies. The highway will revolutionize transportation.

A $25,000-bond issue will pay for the road. The highway extends due north from Ringling to the Stephens county line, and then east to Chapman. Feeders will be provided, and before summer is ended every farmer and oil man living within 15 miles of Ringling, north and northwest, will have a good road to the Fox Pool highway.

N. A. A. A. J. MEETING POSTPONED

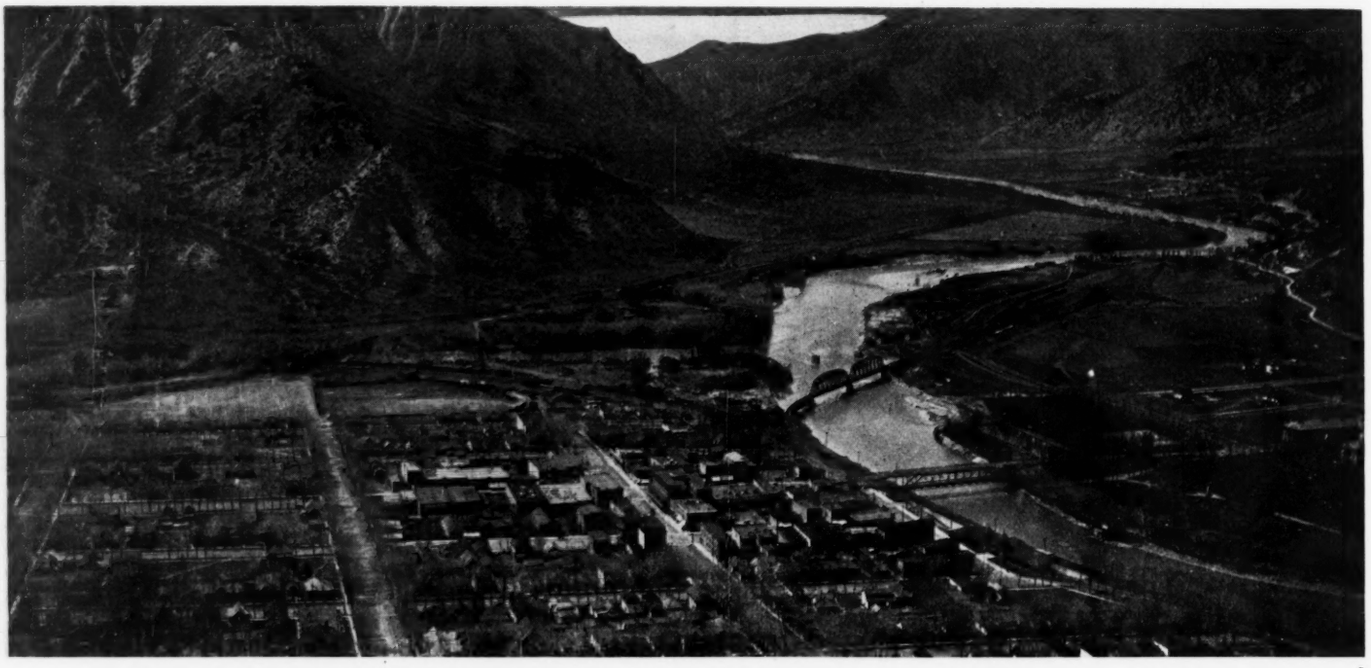
Chicago, May 15—The convention of the N. A. A. A. J. which was to have been held at Hot Springs, June 4, 5, 6, has been postponed by a mail vote of 2 to 1. This is the period of year when it is most difficult to hold a meeting normally and this and the war situation were responsible for the postponement.

EQUIPMENT OF CARS IN UNIONTOWN DEALERS' RACE

CAR	DRIVER	NO. CYL.	BORE	STROKE	DISP.	CARB.	IGNITION	PLUGS	NO. PLUGS	NO. VALVES	VALVE LOCATION	TIRES	WHEEL-BASE	WHEELS	PISTONS	OIL
Packard	Monohan	6	4 3/8	5½	539.5	Miller	Bosch	A. C.	12	12	Both sides	Silvertown	121	Houk	Vanadium	Mobiloil
Peerless	Fetterman	8	3¼	5	331	Ball & Ball	Atwater Kent	A. C.	8	16	Inside V	Goodyear	103	R. W.	Magnalite	Oilzum
Haynes	McCarthy	12	2¾	5	356.2	Miller	Delco	A. C.	12	24	Head	Goodyear	105	Houk	Lynite	Mobiloil
Murray	McFarland	8	3¼	5	331.8	Zenith	Dixie	A. C.	8	16	Inside V	Silvertown	108	R. W.	Lynite	Wolf's Head
Buick	Hudoc	4	4½	5	300.7	Miller	Bosch	A. C.	4	8	Head	Silvertown	104	Houk	Lynite	Mobiloil
Murray	Wynn	8	3¼	5	331.8	Zenith	Dixie	A. C.	8	16	Inside V	Goodyear	128	Houk	Lynite	Wolf's Head
Haynes	Robinson	6	3½	5	288.6	Tillotson	Remy	Rajah	6	12	Right side	Goodyear	102	Houk	Lynite	Oilzum
Maxwell	Stuller	4	3⅞	4¼	175.5	Sprung	Simms	A. C.	4	8	Right side	U. S.	103	Wood	Magnalite	Mobiloil

All cars equipped with Boyce Moto-Meters. All have Hartford shock absorbers except Robinson's Haynes, which has Gabriel Snubbers.

The new safety rail is to prevent repetition of the tragedy at the first Uniontown race. Note the crowd in attendance. ....The total number is estimated at more than 20,000



As Glenwood Springs looks from the mountains on the east side. The hot pool and grounds of the Hotel Colorado are in the foreground on the extreme right

Nature's Rendezvous

Colorado's Rockies as Seen from Pike's Peak Highway Between Colorado Springs and Glenwood Springs

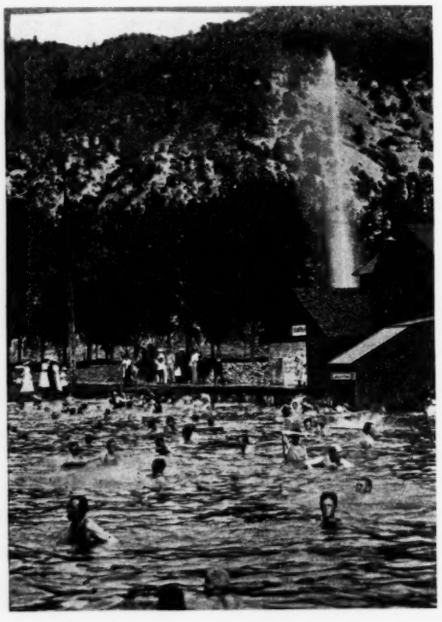
In Two Parts—Part II

By William K. Gibbs

TO the unseasoned traveler the jump between Middle Western prairies and Colorado's Rockies west of Tennessee Pass is too broad to span with the imagination and almost too broad to comprehend once there, unless you spend considerable time. Here you never wonder why this range was named the Rockies; no other name would have been appropriate. As I already said, when we dropped down the western slope from Tennessee Pass I evolved the title applied to this description of our tour over Colorado's section of the Pike's Peak Ocean-to-Ocean highway—"Nature's Rendezvous."

500 Miles of Scenery in 100

Comparison of that section of the Pike's Peak Ocean-to-Ocean highway between Tennessee Pass and Glenwood Springs with that of any other section is difficult, but I have heard the expression that this trip condenses 500 miles of scenery in a ride of less than a hundred miles and this is a very conservative statement. Were it possible for one to obtain all the exclamations of wonder and admiration that have been uttered by persons passing through this particular region one would have a book of the most expressive superlatives of the English language. Mr. Kyle, our host, and Miss Cook, our other companion on the trip, although they had made this tour many times and have lived in the Rockies long enough to have the novelties wear away, were seemingly as enthusiastic as we were and we were admittedly tenderfeet in mountain surroundings. Every turn of the road, and there are many, unfolded some scene more beautiful than the ones behind and it was not long until we were stumped to express our feelings. Words at our command seemed most inadequate to express the effect of the scenery on the screens of our minds. Nature surely has been kind to this immediate locality. Verily, it is her storehouse, well stocked with everything that seems worth seeing.

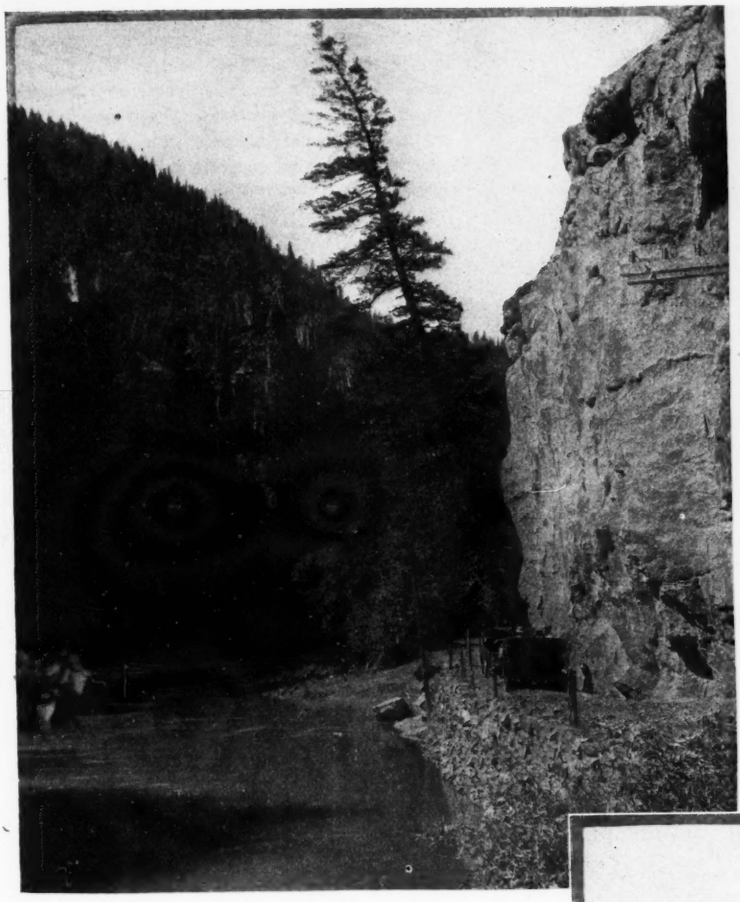


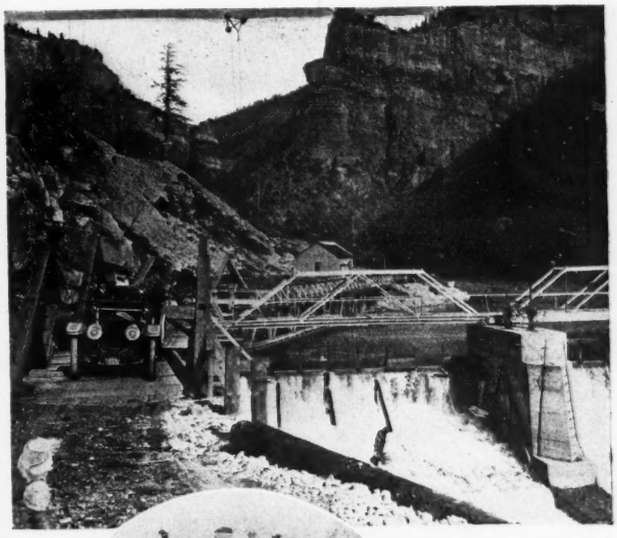
Winter or summer, the hot pool at Glenwood Springs has its swimmers. It is the largest mineral pool in the world

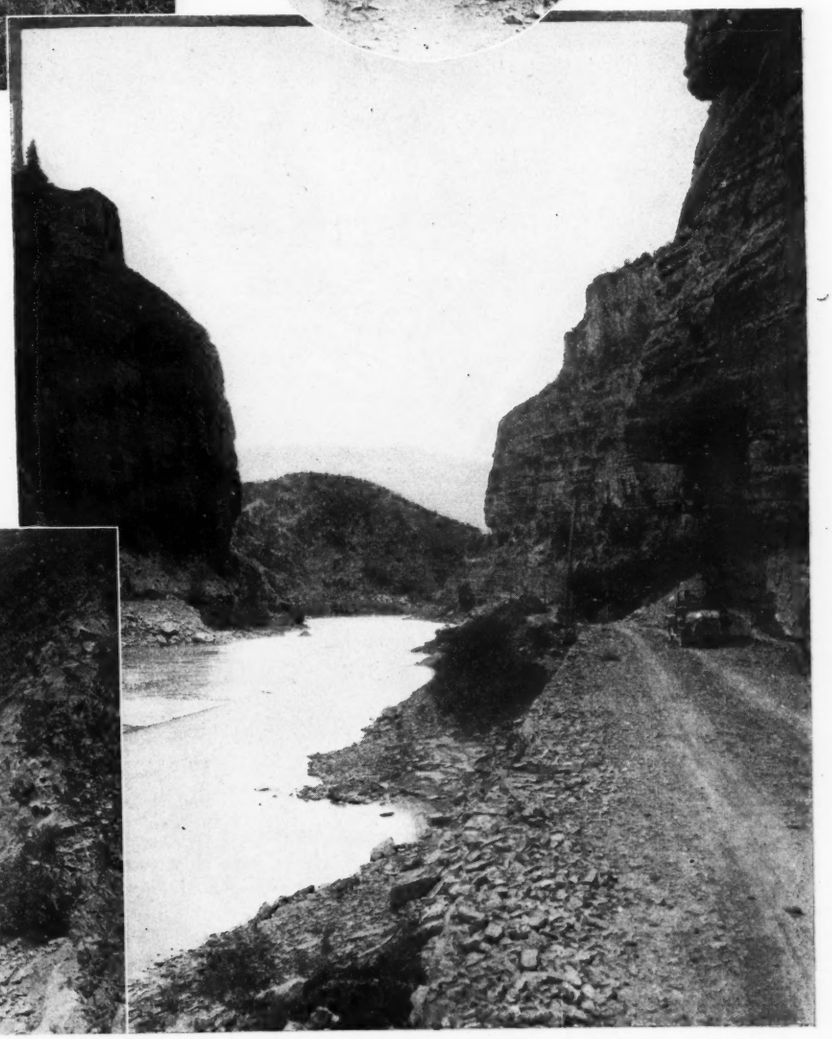
Road an Abandoned Railroad Grade

Some of the way down the western slope of the Continental Divide the Pike's Peak highway follows an abandoned railroad grade, that of the Denver and Rio Grande before it tunneled through the Divide. Abandoned towns are found on the abandoned railroad—the railroad was their only artery of life and when that moved away they died. Mitchell, about two miles west of the Pass, is an example of this.

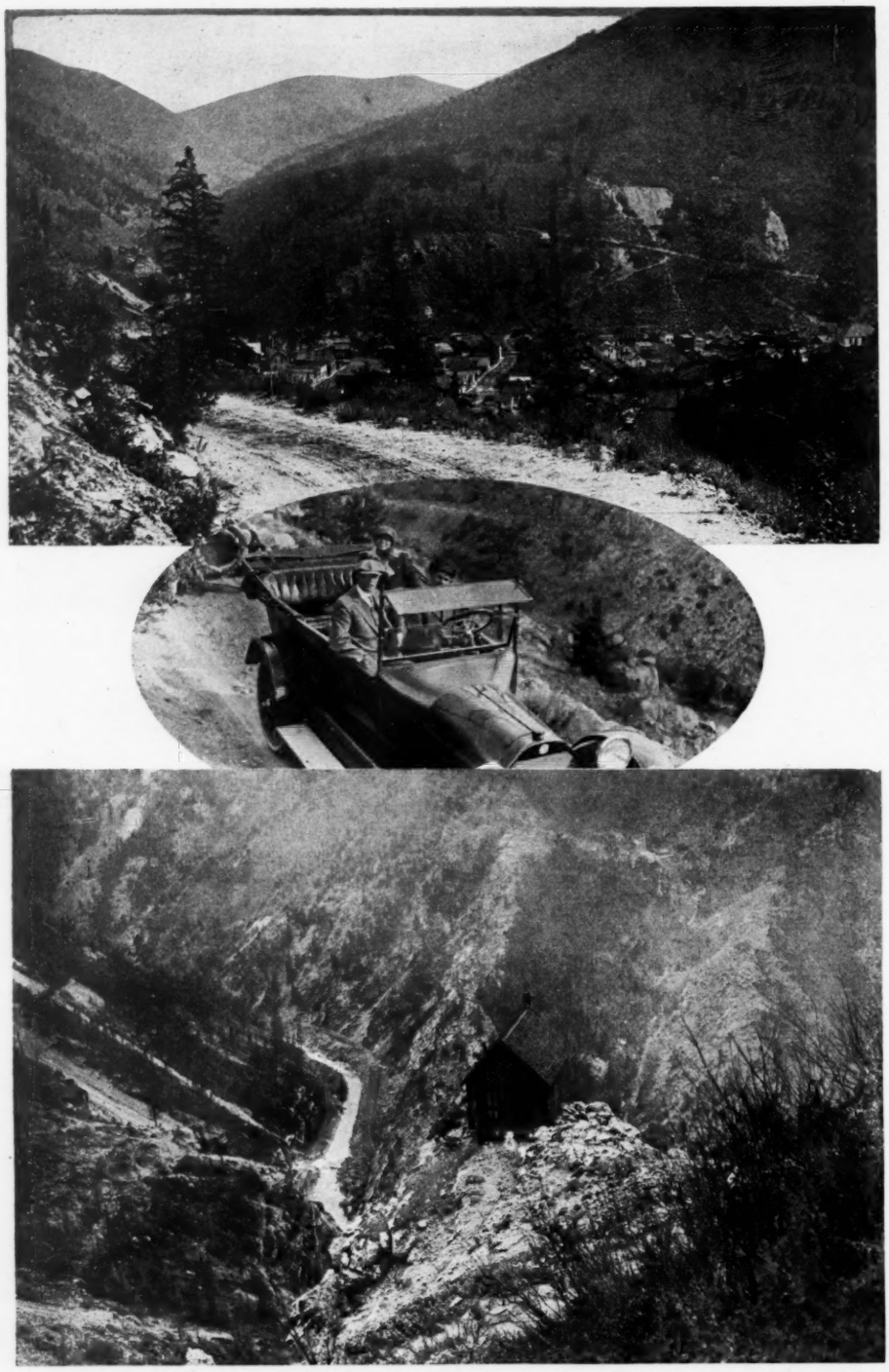
Six miles to the west of Tennessee Pass is the only point on the highway from which one can see Mount Holy Cross. Across the face of this mountain there is a deep crevice and bisecting this horizontal fissure is one running perpendicularly. These two crevices are always filled with snow and this snow makes the outlines of these crev-







Upper left—Deep in the canyon of the Grand river near Glenwood Springs. Meeting another vehicle here means one or the other must back up to a turnout. Upper right—At the Shoshone dam, where Colorado's electric power is generated. In circle—On the floor of the canyon of the Grand. Lower right—This shows how the Pike's Peak highway is hewn out of solid rock. Note the overhanging ledge. Lower left—Type of road Warden Tynan's convicts are building through the canyon of the Grand. This road is being blasted out of the mountainside



Above is shown a bird's eye view of Red Cliff from the Battle Mountain road. In the oval is our party between Buena Vista and Leadville. Note the spare tire on the front of the car behind. Below is a view taken near Gilman where the roadway hangs high above the river and railroad in the bottom of the canyon more than 3,000 feet down

ices stand out in relief like a giant cross. If you who read this ever make the trip, begin watching for Mount Holy Cross when you are about four miles west of the Pass. The road will make a sharp swing to the right around the mountain and down toward the valley below. On the left is a fork of the Eagle river. As you get to the extreme right point of this swing in the road there is a bridge over the east fork of the Eagle river and just after crossing the bridge the road swings sharply to the left and it is just at this point that the peak of Mount Holy Cross may be seen towering above the mountains in the immediate foreground to the southwest.

Some five miles farther we began descent into Red Cliff, tucked away in a tiny pocket at the base of Battle Mountain. On the left the Eagle river rushes madly down the steep decline while the road hugs close to the precipitous sides of the canyon. Here again one does not wonder at the name of of the town for the walls of Battle Mountain are red—the garish red so commonly seen on the picture post cards with which your friends deluge you when they get out in the Rockies and which carry colors so vivid that you are skeptical of their being true to nature. You must remember though that the master inventor oftentimes builds in his workshop things of which you little dream and which sometimes never see light outside of that workshop. It is so here. Nature has introduced coloring in this rendezvous of hers that would make cubist art seem as understandable as a primer.

Very few roads open up scenery as awe-inspiring as that which is unfolded before you as you climb Battle Mountain out of Red Cliff. This road is solid, slants slightly inward and is well kept up, being wide enough in most places for two vehicles to pass. Just before we left Red Cliff we could see some other cars high up on the mountain side that looked more like toys than touring cars. At intervals one sees many little piles of dirt resembling ant hills on the side of the mountain. These are where prospectors have sought the yellow lure that has made men become kings of finance, die of hunger, or go insane.

Awe-Inspiring Scene Unfolds

I can compare the climb up Battle Mountain, skirting its summit and negotiating switchbacks into Gilman to but one thing as a thrill producer. Some day when you can arrange it try walking along the cornice of a modern skyscraper. This comes the nearest to the sensation of skirting Battle Mountain of anything I know of that you can try except in a mountainous country. Some conception of the drop from the roadway to the river below is given by one of the illustrations which is taken from a point near Gilman. Most of the way between Red Cliff and Gilman you hang some 2000 to 3000 ft. above the river and the Rio Grande railroad tracks. Literally glued to the precipitous mountainside are mine houses that seem likely to topple into the canyon below at any time.

Volcanic Imprint in Eagle River Valley

There are a number of sharp turns and a heavy grade out of Gilman going down into Minturn. Soon after Minturn we came into the Eagle river valley, one of the most productive sections of Colorado. Threading our way between many fine farms we reached Gypsum in the middle of the afternoon. From here on the road is skirted with lava formations of wonderful colorings. Some volcanic eruption ages ago left its imprint on this valley. Down the mountainside poured the molten lava. On its journey it cooled and now along the base of the mountains are conical pyramids of this once molten rock that are not unlike the slag piles of the steel mills.

Ten miles out of Gypsum we entered the Canyon of the Grand, where for fifteen miles the road follows the windings of the river through the marvelous canyon, with its towering walls and peaks of many hues. Did you ever see a flower garden that did not have its specialty, that is, some one part that appealed to the owner more than any other? This must be Nature's favored spot in her rendezvous,

her most sacred treasure room. Sometimes you are deep down between towering cliffs, almost on a level with the water; a little later you climb high above the river, and such a river! It is a turbulent stream and is the only thing that hurries to get out of the canyon. Certainly no tourist ever was in a hurry to get through the Canyon of the Grand. We would have liked to stay there days, just to look and wonder at the master works of Nature.

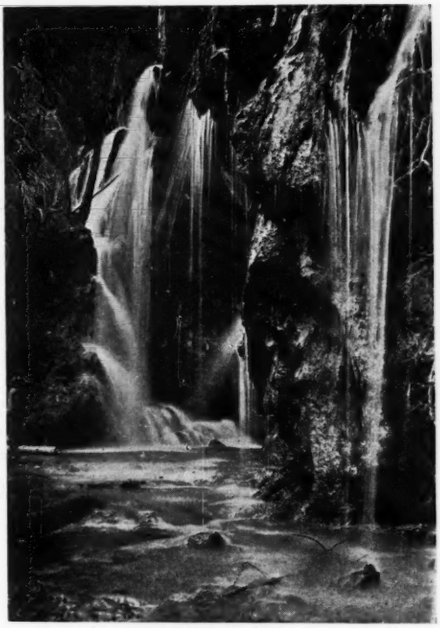
Shoeshone State's Electric Source

Six miles from the entrance to the canyon the waters of the river are directed into the mountain side, carried for three miles through a tunnel blasted through the mountain and let down a giant spillway to operate the turbines that furnish electrical power for almost all of Colorado. It is interesting to see how the electric current is taken from the powerplant to the outside world because the plant itself is tucked away in a canyon nearly three-quarters of a mile deep. Stretched from the peak on one side of the canyon to the peak on the other, so high up that it is difficult to see, is a cable which holds two cross-arms between which are stretched several wires much like the antennae of a wireless station. From one of these cross-arms a cable drops down into the powerplant. On the opposite side of the river at this point is the Rio Grande railroad and supplies for the powerplant are brought across the river on a cable.

Shortly west of the Shoshone station we came out upon the new road being built by Warden Tynan's convicts. This year will see this road completed and when finished it will give a rock road practically fifty feet wide throughout the canyon. It certainly will give tourists through the canyon, especially the driver of the car, a better opportunity to enjoy the scenery. As it was when we went through the road was narrow and it required careful driving and a close attention to the road. Mr. Kyle is said to be one of the best drivers in Colorado. He has been associated with motor cars since their beginning, was a bicycle racer before there were any motor cars and is numbered among MOTOR AGE's oldest subscribers, having been a subscriber to one of the cycling publications that were consolidated to make MOTOR AGE.

It was with a feeling ef regret that we came to the end of the canyon and entered Glenwood Springs, not because Glenwood Springs is lacking in charm, but because the Canyon of the Grand had impressed us so much. It is the mental picture that is burned into the screen of my memory such as I told you in the beginning of this story. The wonderful Hanging Lake and Spouting rock in Glenwood Canyon are unrivaled for their beauty and charm thousands of visitors every year.

Glenwood Springs is at the junction of the Roaring Fork and Grand rivers on the western slope of the Colorado Rockies. It is surrounded by a wealth of mountain scenery and has hot mineral springs and vapor caves which were used by the Indians in the early days. It can boast of the largest mineral water swimming pool in the world, used every day of the year. It is no uncommon sight, we were told, to see persons skating on the ice on a pool on one side of the street, while on the other persons are enjoying a swim in the hot mineral water. The mammoth spring is known as Yampah, and it supplies water to the pool and bath houses. It is 60 ft. in diameter, about 5 ft. deep and has a measured flow of 2889 gal. per minute. The temperature of the spring is 127 deg. Fahr. Large quantities of carbonic acid, together with a perceptible supply of sulphureted hydrogen issue from the water and give it the appearance of boiling. The water of the pool is tempered with cold water. We discovered that inhaling this water caused no smarting of the nasal tissues but had a soothing effect.



Falls below Hanging Lake in the Canyon of the Grand river near Glenwood Springs

The Hotel Colorado is the show place of Glenwood Springs. Here gathers the society of many large eastern and western cities. One might think they had stepped into the ballroom of the Astor in New York or the Blackstone in Chicago, if they were to judge by the appointments of the hotel and the apparel of the guests. The grounds of the hotel are especially attractive and are terraced down to the hot pool which is on a level with the river.

This drive of over 200 miles from Colorado Springs to Glenwood Springs is through a country rich in natural beauty and once seen is always remembered. This section of the Pikes Peak highway is the main gateway to the central Colorado Rockies.

There are no grades on this section of the Pike's Peak Ocean-to-Ocean highway that are especially difficult, and we saw many cars of all kinds, for the most part heavily loaded, all making the trip with apparent ease. Tennessee Pass is open to travel perhaps more months out of the year than any other pass over the Divide in Colorado. Towns are sufficiently close together to give the tourist accommodations any time of the day he desires, and garages and repair shops are frequent.

Much improvement is being made on this section of the highway each year. Grades are being made easier, turns have been widened and circuitous parts of the road have been straightened so that there is nothing to detract from the pleasures of motoring over this section of the highway. Turns, bridges, turnouts and railroad crossings are marked with regulation signs, the symbol being as easily understandable as the wording of the signs. There are many places where but little of the road is visible to the driver at one time, but by the judicious placing of signs he can tell the condition of the road around the turn ahead of him.

Looking back into Eagle Canyon from a point high up on Battle Mountain. The road is seen winding down through the canyon entering Red Cliff. Eagle river at the right

Routes and Touring Information

El Reno, Okla.-Gallup, N. M.

ONCHO, OKLA.—Editor MOTOR AGE—Give shortest and best route from El Reno, Okla., to Gallup, N. M.; also mileage. —W. B. McCown.

From El Reno proceed to Calumet, Geary, Bridgeport, Hydro, Weatherford, Clinton, Foss, Canute, Sayre, Delhi, Texola, Shamrock, Tex., McLean, Groom, Amarillo, San Jon, Tucumcari, Cuervo, Santa Rosa, Encino, Aubuquerque, Armijo, Isleta, Peralta, Los Lunas, Paraje, Grants, Thoreau, to Gallup. The route covers approximately 775 miles.

Vol. 7 of the Automobile Blue Book, published by the Automobile Blue Book Publishing Co., 910 S. Michigan Ave., Chicago, contains complete running directions for this trip; price $3.00.

Fort Worth, Tex.-Los Angeles, Cal.

Fort Worth, Tex.—Editor MOTOR AGE—Give route from here to Los Angeles.—Mrs. C. W. Bagley.

From Fort Worth proceed to Weatherford, Garner, Caddo, Breckenridge, Albany, Hamby, Abilene, Hermleigh, Snyder, Tahoka, Brownfield, Gomez, Plains, Roswell, Negra, Estancia, Moriarty, Albuquerque, Becker, Socorro, Magdalena, Datil, Quemado, Springerville, Cooleys Ranch, Rice, Globe, Roosevelt Dam, Mesa, Tempe, Phoenix, Liberty, Arlington, Aqua Caliente, Palomas, Dome, Yuma, Holtville, El Centro, Dixieland, Camp, Jamul, Encanto, San Diego, Escondido, San Marcos, Bonsall, Fallbrook, Elsinore, Riverside, Ontario, Pomona, DelMonte, Savanah, Los Angeles.

Vols. 7 and 8 of the Automobile Blue Book, published by the Automobile Blue Book Pub. Co., 910 S. Michigan Ave., Chicago, contain complete running directions for this trip.

Nashville, Tenn.-Chattanooga, Tenn.-Washington, D. C.

Danville, Ill.—Editor MOTOR AGE—Outline the best route from Nashville to Chattanooga, thence on to Washington, D. C.—Earle Comer.

From Nashville, the route goes through LaVergne, Murfreesboro, Beechgrove, Manchester, Hillsboro, Pelham, Monteagle, Tracy City, Jasper, Rankins Ferry, Wauhatchie, Chattanooga, Ooltewah, Tucker Springs, Calhoun, Athens, Niota, Sweetwater, Philadelphia, Tenn., Loudon, Knoxville, Straw Plain, Jefferson City, Morristown, Warrensburg, Greenville, Limestone, Telford, Jonesboro, Johnson City, Milligan, Childras, Bluff City, Bristol, Abingdon, Chilhowie, Marion, Wytheville, Radford, Christiansburg, Elliston, Salem, Roanoke, Blue Ridge, Thaxton, Bedford City, Lynchburg, Amherst, Lovingston, Redhill, Charlottesville, Cismont, Gordonsville, Madison Mills, Culpeper, Remington, Opal, Bethel, Halfway, Middleburg, Fairfax, Oakton, McLean, Langley, Georgetown, Washington, D. C.

Vol. 6 of the Automobile Blue Book, published by the Automobile Blue Book Pub. Co., 910 S. Michigan Ave., Chicago, contains complete running directions for this trip.

Des Moines, Iowa-Chattanooga, Tenn.

Adel, Iowa.—Editor MOTOR AGE—Give touring instructions from Des Moines to Chattanooga.—E. A. Witmer.

From Des Moines proceed to Colfax, Newton, Kellogg, Grinnell, Brooklyn, Victor, Ladora, Marengo, Oxford, Coralville, Iowa City, Moscow, Durant, Davenport, Rock Island, Ill., Milan, Swedonia, Alpha, Henderson, Galesburg, Knoxville, Brimfield, Peoria, East Peoria, Groveland, Dillon, Delavan, New Holland, Middletown, Springfield, Mechanicsburg, Decatur, Hammond, Atwood, Tuscola, Newman, Hume, Chrisman, Montezuma, Rockville, Indianapolis, Franklin, Taylorsville, Columbus, Seymour, Vallonia, Kossuth, Salem, Borden, New Albany, Louisville, Ky., Mount Washington, Bardstown, New Haven, Hodgenville, Buffalo, Hardyville, Cave City, Scottsville, Gallatin, Nashville, LaVergne, Murfreesboro, Shelbyville, Bellville, Fayetteville, Hazel Green, Ala., Meridianville, Huntsville, Cottonville, Guntersville, Albertville, Boaz, Mountainboro, Attalia, Alabama City, Rome, Cartersville, Emerson, Acworth, Marietta, Smyrna, Marietta, Cartersville, Cassville, Calhoun, Resaca, Dalton, Ringgold, Boynton, Rossville, to Chattanooga, Tenn.

Vols. 5 and 6 of the Automobile Blue Book, published by the Automobile Blue Book Pub. Co., 910 S. Michigan Ave., Chicago, contain complete running directions for this trip.

Newton, Iowa-San Benito, Tex.

Newton, Iowa.—Editor MOTOR AGE—Give best route from here to San Benito, Tex.—C. E. Greenlief.

From Newton, Iowa, proceed to Des Moines, Indianola, Medora, Osceola, Leon, Davis City, Lamoni, Iowa, Eagleville, Mo., Bethany, Albany, King City, Union City, St. Joseph, DeKalb, Weston, Kansas City, Harrisonville, Archie, Adrian, Butler, Arthur, Horton, Nevada, Moundsville, Liberal, Galesburg, Joplin, Galena, Kan., Lowell, Lincolnville, Okla., Miami, Venita, Chelsea, Claremore, Collinsville, Tulsa, Red Fork, Bowden, Kellyville, Bristow, Depew, Oklahoma City, Packingtown, Yukon, El Reno, Pocasset, Verden, Anadarko, Apache, Fort Sill, Randlett, Buckburnett, Tex., Wichita Falls, Archer City, Elbert, Albany, Baird, Coleman, Shield, Lohn, Brady, Mason, Fredericksburg, Waring, Leon Springs, San Antonio, Thelma, Leming, Campbellton, Whitsett, Kittie, Mathis, Corpus Christi, Kingville, Sarita, Raymondsville, Cameron, Harlingen and San Benito.

Vols. 5 and 7 of the Automobile Blue Book, published by the Automobile Blue Book Pub. Co., 910 S. Michigan Ave., Chicago, contain complete running directions for this trip.

Beaver Dam, Ky.-Colorado Springs, Col.

Beaver Dam, Ky.—Editor MOTOR AGE—Outline route from here to Colorado Springs, Colo. Is it advisable to have a guide book?—Vilas Peters.

From Beaver Dam, proceed to Rockport, Central City, Madisonville, Nebo, Dixon, Wanamaker, Cairo, Weavertown, Henderson, Howell, Evansville, Ind., Stringtown, Warrentown, Fort Branch, Princeton, Patoka, Hazleton, Vincennes, Lawrenceville, Ill., Olney, Noble, Clay City, Flora, Salem, Odin, Sandoval, Carlisle, Breese, Trenton, Lebanon, O'Fallon, Edgemont, East St. Louis, St. Louis, Dwyer, Altheim, Ellisville, Hollow, Gray Summit, Washington, Berger, Hermann, Morrison, Chamois, Osage City, Jefferson City, Centertown, McGirks, California, Clarksburg, Tipton, Otterville, Sedalia, Montserrat, Warrensburg, Centerview, Holden, Strassburg, Pleasant Hill, Lee's Summit, Kansas City, Waldo, Overland Park, Lenexa, Olathe, Edgerton, Ottawa, Waverly, Emporia, Elmdale, Florence, Peabody, Walton, Newton, Halstead, Hutchison, Nickerson, Sterling, Lyons, Great Bend, Kinsley, Spearville, Dodge City, Cimmarron, Garden City, Deerfield, Lakin, Kendall, Syracuse, Coolidge, Holly, Colo., Granada, Lamar, Hastey, Las Animas, LaJunta, Rocky Ford, Manzanola, Pueblo, Fountain, Colorado Springs.

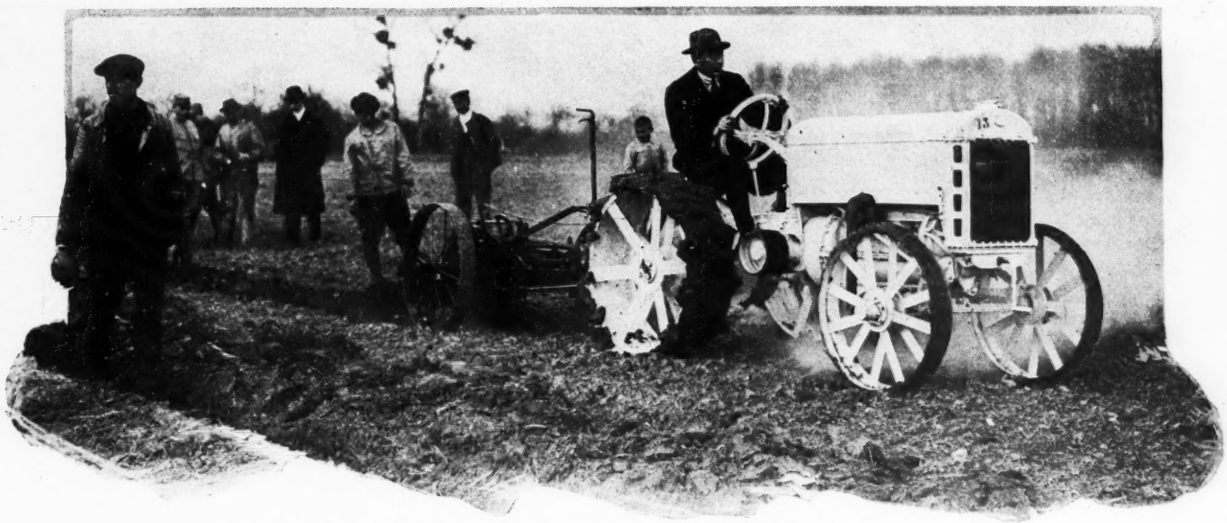
It is advisable to have a guide book for this contains information as to points of interest, condition of roads, running directions, etc. Vols. 5 and 7 of the Automobile Blue Book, published by the Automobile Blue Book Pub. Co., 910 S. Michigan Ave., Chicago, cover the above tour; price $3 each.

Reno, Nev.-Gainesville, Fla.

Nixon, Nev.—Editor MOTOR AGE—Give routing from Reno, Nev., to Gainesville, Fla.; also mileage.—S. W. Cressey.

From Reno, proceed to Leete, Hot Springs, Lovelock, Imlay, Winnemucca, Golconda, Battle Mountain, Carlin, Elko, Deeth, Wells, Cobre, Montello, Tacoma, Nev., Lucin, Utah, Rosette, Snowville, Tremonton, Deweyville, Brigham, Willard, Ogden, Salt Lake City, Wanship, Coalville, Evanston, Wyo., Fort Bridger, Lyman, Green River, Rock Springs, Point of Rock, Wamsutter, Rawlins, Fort Steel, Hanna, Evansville, Rock River, Bosler, Laramie, Red Buttes, Sherman, Buford, Cheyenne, Egbert, Bushnell, Kimball, Potter, Sidney, Lodgepole, Bigspring, Brule, Ogallala, Paxton, Sutherland, North Platte, Gothenburg, Cozad, Elm Creek, Kearney, Shelton, Wood River, Grand Island, Chapman, Clarks, Duncan, Columbus, Richland, Schuyler, North Bend, Ames, Fremont, Waterloo, Elkhorn, Omaha, Neb., Council Bluffs, Iowa, Underwood, Minden, Avoca, Walnut, Exira, Guthrie Center, Monteith, Dale City, Redfield, Adel, Des Moines, Colfax, Newton, Grinnell, Brooklyn, Victor, Ladora, Marengo, Oxford, Coralville, Iowa City, West Liberty, Moscow, Durant, Davenport, Moline, Ill., Watertown, Hillsdale, Erie, Galt, Sterling, Chicago, Dyer, Kreitzburg, Brunswick, Lowell, Schneider, Morocco, Ade, Goodland, Wolcott, Montmorenci, Lafayette, Frankfort, Antioch, Lebanon, Royalton, Flackville, Indianapolis, Franklin, Taylorsville, Columbus, Seymour, Brownstown, Vallonia, Salem, Pekin, Borden, New Albany, Louisville, Mount, Washington, Bardstown, Athertonville, Buffalo, Hardyville, Bear Wallow, Mammoth Cave, Cave City, Glasgow, Scottsville, Gallatin, Nashville, LaVergne, Jefferson, Murfreesboro, Shelbyville, Bellville, Fayetteville, Tenn., Meridianville, Huntsville, Ala., Cottonville, Guntersville, Boaz, Attala, Gadsden, Rome, Ga., Cartersville, Acworth, Marietta, Smyrna, Atlanta, Jonesboro, Pomona, Griffin, Milner, Barnesville, Macon, Perry, Henderson, Graydon, Cordele, Sibley, Ashburn, Tifton, Lenox, Adel, Hahira, Mineola, Valdosta, Lake Park, Jennings, Jasper, Genoa, White Springs, Winfield, Lake City, Mason, High Springs to Gainesville. This route approximates 4000 miles.

Vols. 8, 7, 5, 4 and 6 of the Automobile Blue Book, published by the Automobile Blue Book Co., 910 South Michigan avenue, Chicago, contain complete running directions for the trip.



The Ford tractor turning over French soil for the first time

Ford Tractor Makes French Debut

Shows Well in Competition — France Will Require 1000 Machines This Year

By W. F. Bradley

HENRY FORD'S tractor turned over the the first acre of French soil in a Government-organized agricultural motor competition held in April on the outskirts of Paris. There were twenty-two competitors, fifteen of them being American and seven French. With the exception of the Ford, which had not been uncovered until the opening day of the competition, and was entirely unknown even to the Ford mechanics, all the machines were old acquaintances in competitions of this nature. For an opening performance the Ford machine ran well; it attracted more attention than any of the others among both agriculturists and mechanics, both on account of the originality of its design and the reputation of its maker. The general opinion is that it is a type of machine very well suited to French conditions, and capable of being sold in quantities. The Ford representatives were unable to accept orders, for they had no guarantee of delivery, and did not know the price of the machine on the French market.

The French Ministry of Agriculture was responsible for the tractor demonstration which comprised two days' competitive spring plowing. The ground selected belonged to the State Agricultural School, and was the worst possible. The naturally heavy clay had been sodden by weeks of steady rain, and in many places there were under the surface pockets of water which proved treacherous places for all the heavier and some of the lighter tractors. Some of the powerful American tractors, with a dead weight of four tons, got into these soft patches and had to be dug out with pick, spade, crowbar, jacks and planks; even some of the lighter tractors got into temporary difficulties from time to time.

As the result of the competitive portion of this demonstration, it was intended to make awards and also to make Government purchases, these being to swell the 408 tractors which are claimed to be working at the present time in various parts of France. Up to the present time the Government has shown its interest by granting subsidies for the purchase of tractors by groups of farmers, or by communes for the general use of the farmers in their district. The co-operative system has been only a partial success, owing to the prevalent feeling that the more powerful members of the group will get all the advantages to the detriment of the others. Another scheme which is being developed in France is for a firm to hold a large number of tractors, with capable operators, and undertake plowing and other farming operations at fixed rates. As farms are small in France, this scheme is capable of development and should be successful.

Although the French ministry of Agriculture voted a credit of $10,000 for the holding of this competition, and although the head of the department paid an official visit, it is certain that full value was not obtained. There was practically no publicity in connection with the affair, and at no time did the prospective purchasers equal the number of exhibitors and attendants. Whatever the result of the awards, they are looked upon with suspicion, for the members of the jury appeared to have all kinds of

Rock Island tractor in competition in French demonstration field

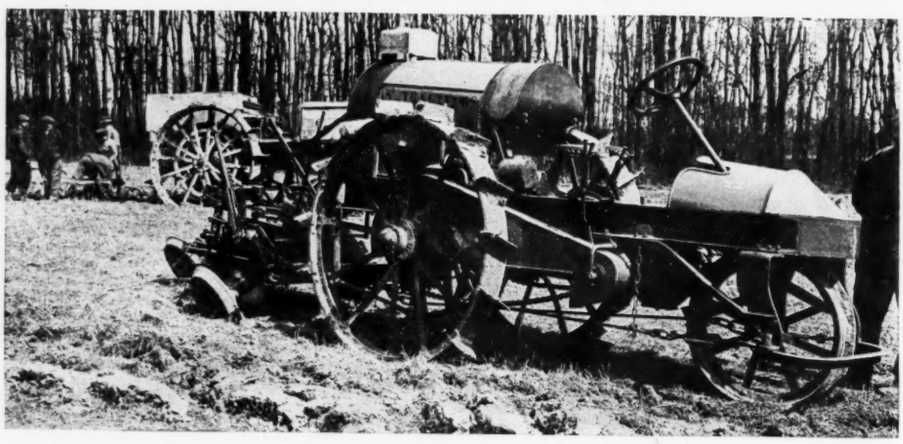
Motoculture Francaise agricultural machine used as a tractor in demonstration in France

qualifications, except a knowledge of agriculture and mechanics. Among them were to be found a professor of Egyptian history, a lawyer, and an expert statistician. For some reason or other the real agricultural experts were not invited to take part in the event.

Variety of Machines in Contest

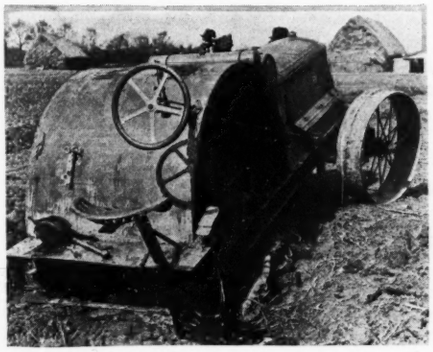
Variety was the keynote of the machines taking part in the competition. Among the seven French no two were alike in design; nor did the larger American contingent show any greater uniformity. All the French machines had been seen before, some of them being very familiar figures in competitions of this nature, and had not undergone more than detail modifications. Generally the machines are the product of one-sided concerns—men who have good agricultural, but limited mechanical knowledge, or good mechanics with limited agricultural experience. In no case has the designer of a machine really substantial financial backing or a good commercial organization in his support. The war held back some schemes which were about ripe for development, and since then the Government has decided that the after-the-war use of a new big arsenal shall be the production of tractors and agricultural machinery. Vested interests are opposing this scheme with all their might.

Two of the French machines, the Tourand-Latil and the Motoculture Francaise have rotary plows, but were both used as ordinary tractors hauling a plow. The Tourand-Latil is the product of a motor car engineer who has just linked up with the Latil company, one of the leading makers of army four-wheel drive tractors. This machine worked with a direct-hauled plow with adjustable plowshares; previously it had operated with a rotator. The Motoculture Francaise machine is of Swiss origin; it is a three-wheeler without a frame. In other words, the engine base forms the frame of the machine. It also operated as an ordinary tractor hauling a plow. The Lefebvre was alone in representing the caterpillar type. The De Salvert, a big tractor with 7-ft. diameter driving wheels, obviously had been got together as far as



Top—The little Case tractor did good work and showed well in the competition Center—The Filtz, one of the most successful of the French tractors. Below—Societe des Tracteurs Agricoles, a three-wheeler chain drive French machine

Touraud-Latil tractor with its inventor in the foregound



The Emerson tractor, which sat on its tail in the soft ground

possible with motor truck parts. The Filtz tractor represents a popular and well-developed type with a 40-hp. engine at the rear of the frame, the drive being carried forward to a countershaft, and then from this shaft to the rear wheels by means of side chains. The tractor has four wheels, and is both light and powerful. The Societe des Tracteurs Agricoles exhibited a similar design with single instead of dual steering wheels. The only other French machine was the Doisy, a purely motor car type tractor with winding drum for cable plowing, but which was worked as an ordinary tractor.

American Representation Large

The American machines on exhibit were: Moline, Little Giant, Rock Island, International Harvester Co.'s Mogul and Titan, two Emersons, three different model Case machines, the Globe, the Bull, and Henry Ford's new tractor. French conditions favor the smaller type tractors, some of the big machines being entirely unsuitable for the small French farms. The high price of gasoline makes the use of kerosene a decided advantage, but the only machines which appeared to be using this fuel were the Ford and the Globe. For manufacturers who are interested in the French market it will be necessary to keep a close watch on alcohol, for it is quite likely that this fuel will come very much to the front as soon as the war is over. The Government has pledged itself to popularize industrial alcohol, and by doing so naturally will favor the native agricultural interests.

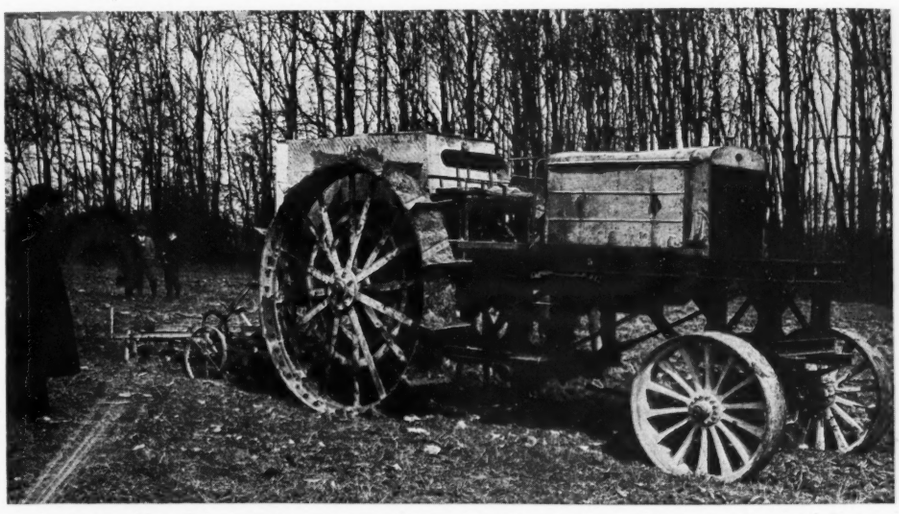
Although a much more extensive system of cultivation in France has made conditions quite different from England, where land has systematically been left out of cultivation, France ought to be able to absorb 1000 tractors at once and a greater number the second year. If, as seems probable at the present time, the whole of the northeastern portion of France is going to be freed from the enemy this year, an immense area will be in need of tractors and other kinds of agricultural machinery. Even where the design of French machines is complete, the firms are not in a position to produce in quantities, and the supply must inevitably be obtained from America.

English manufacturers are in arms at the decision of the government to allow Henry Ford to build a factory at Cork, Ireland, for the production of his tractor. They claim that this factory cannot be working for a full year, and that 2000 tractors are wanted immediately. In their opinion Henry Ford is being given facilities which are denied all British manufacturers, and when the factory is completed there is no guarantee that it will not be used for the production of motor cars in addition to the agricultural tractor.

As a challenge to the action of the Ministry of Munition a very important trade committee has guaranteed to produce 10,000 farm tractors on a co-operative scheme within a period of six months, thus making them ready for autumn plowing. They claim that the Ford factory, which is not yet built, cannot produce before 1918, so that the English scheme would beat this on delivery by several months, while keeping the tractor industry out of American hands. The men responsible for this scheme are Herbert Austin, Austin motors; A. McCormack, Wolseley; J. Pullinger, Arrol-Johnston; the Clayton & Shuttleworth Co., Saunderson & Mills, and David Citroen.

MILWAUKEE PLANS TRACK RACES

Milwaukee, Wis., May 12—A Wisconsin motor racing association is being organized in Milwaukee under the direction of Leslie D. Frint, head of the Frint Motor Car Co. and Chevrolet distributer for Wisconsin and Upper Michigan, with Bart J. Ruddle, assistant secretary and manager of the Milwaukee Automobile Dealers, Inc., who will have active charge of the activities of the new body. It is planned to conduct a series of race meets throughout the state, using the State Fair Park 1-mile circular dirt track at Milwaukee, and half-mile dirt tracks in county fair grounds at various points in the interior. The Milwaukee dates probably will be Memorial Day and July 4, on which occasions features of a military nature will be arranged.



De Salvert tractor with huge driving wheel

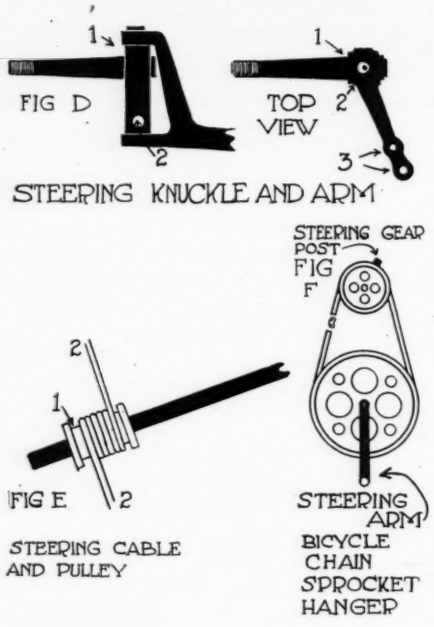
The Junior Racing Car

Its History and Construction

In Three Parts—Part III

By Harry H. Hartz

STEERING-KNUCKLES may be made from one piece, a blacksmith's forging, or by a simple method, as follows: Secure a piece of cold-rolled steel 1-in. square, equal in length to the outside dimensions of the axle yoke. Turn both ends of the steel in the lathe for a distance of ½-in. to the size of the king-bolt holes, preferably ½- or ⅝-in. This will give a secure bearing surface for the knuckles in the axle and will eliminate any other method of fastening them in, as you will see when the two pieces of the axle are clamped on the ash block, the knuckle will be held securely. After the two ends are turned down, holes must be bored for the spindle on which the wheel goes, Fig. D, No. 1, which must necessarily be a separate piece of material and also the arms for the tie rod or steering cable. The spindle will have to be fitted according to the size of the hubs on the wheel.



Arm for Tie Rod

The arm for attaching the tie-rod should be placed in holes bored on the adjacent side of the square steel, No. 2 Fig. 1. Two holes must be bored in the ends of the steering arms to make room for the tie-rod and steering cable, No. 3, Fig. D.

The simplest steering arrangement employs the use of a ⅜-in. wire cable. This cable is wrapped around a spool which is secured to the end of the steering post, Fig. E, No. 1. The steering post is held into the frame by an iron bracket at the most convenient point. The cable is led from the spool to both steering arms after several wraps around the spool have been given, No. 2. Usually turn-buckles are placed at either end of the cable to make necessary adjustments if the wire would stretch. Another simple steering gear, using a bicycle chain, a hanger and a sprocket is illustrated in Fig. F.

Returning to the subject of wheels for the tiny cars, I have stated that they used 20-in. wheels, but there are three sizes of 20-in. wheels which can be secured from practically any aeroplane manufacturer. These are 20- by 4-in., 20 by 3 and 20 by 2. The 20 by 4 wheel is by far the most desirable, as it is provided with double-tube tires, whereas the 20 by 3 and 20 by 2-in. wheels use only single-tube pneumatics, which do not give good service. If either of the two latter size tires are used, it will be necessary to cover them with motorcycle casings or some other such material to get any wear from them as they are too thin to stand the abuse given in racing.

The rear axle may be made out of either 1-in. square or round cold-rolled steel, turned down in the lathe at both ends to receive the wheels. An old motor car axle or drive shaft may be used to good advantage in the construction of this part of the machine as well as for the countershaft.

The countershaft should be of 1-in. stock also. This will have to be tapered at both ends to receive the sprockets, if chain drive, or pulleys if V-belt drive. In either case key-ways must be cut for retaining the sprockets or pulleys. A single chain drive is very nearly as satisfactory as double chain or V-belt and much work is eliminated if this extra chain or belt is done away with.

The countershaft may be mounted on ball, bronze or babbit bearings according to the amount of money which is to be spent. Any of these types works satisfactorily.

Gasoline and oil tanks may be mounted on the frame at the rear of the driver's seat and the latter may be dropped between the frame members. If this is done it will be necessary to use a pressure pump or the Stewart vacuum-feed system. It will be necessary for the oil to be drawn from the tank by a suction pump. Controls, such as gasoline, air, magneto, throttle, etc., can be arranged in handy places around the driver's seat. These minor details can be worked out when the car is nearly completed.

The powerplant, which must necessarily be a one-, two- or four-cylinder motorcycle or light car engine, preferably a two-cylinder motorcycle engine, has caused much inquiry and not a little argument. In answer to the question, "Which is the best engine to use?" which has been asked so many times, I will say that there is not much choice, merely a matter of popular favor. There are few light engines made today but what will adequately serve for this use.

A very satisfactory brake may be constructed on the countershaft by placing a drum on the shaft and making a band to fit this drum and contract and expand the band by a hand or foot lever.

Proper Gear Ratio

This practically concludes the details of construction of the model A car. The gear ratio to be used with these small wheels should be in the vicinity of 2⅝ to 1. With the ordinary motorcycle motor, all other conditions being equal, a speed of from 60 to 70 m.p.h. should be obtained from this type of car.

This model can be built for from $75 to $200, depending upon the amount of work done by the builder, the amount of work hired done, the class of material used, etc.

The model B car is the type of car which I have driven ever since the inception of the miniature car racing game. The Vic-Mac was the car in which I started my racing career. This car had the engine under the hood. With it I won the first Culver City race, but during this classic I found that on taking the turns at high speed the inside or left side of the car had a tendency to raise and in practice the car turned completely over with me. This set me to thinking and planning some way to overcome this difficulty. After much deliberation, I devised the plan of placing the engine on the left side, outside of the frame. This I thought would hold the left side of the car down and aid in preventing turnovers, which theory has proven correct.

It is with this car that I have won practically all the races held in the west and with it recently on the Ascot speedway I turned one lap of the track, or 1 mile, in 54 sec. under official American Automobile Association supervision. This meant a speed of over 80 m.p.h. on the straight stretches and 60 m.p.h or better on the turns.

The car held the ground perfectly and I continue to pin my faith to the engine on the side. This type car has a 42-in. tread and 75-in. wheelbase, 26 by 2¼ Houk Interchangeable wire wheels, especially built for

me by George W. Houk, and tubular axles. No gearset is used. Very light springs are used in the front only.

The construction of this car is much the simpler of the two junior racing car models.

Two pieces of 1- by 3-in. ash are required for the side members of the frame. These pieces must be 81 in. long. No cross members are needed on account of the fact that the absence of springs causes the axles to be secured directly to the frame. This serves to hold the side members in place. The frame is tapered, being 11 in. wide in front and 17 in. wide in the rear, these being inside frame measurements. The axles are made of Shelby steel tubing, which can be secured at almost any wholesale iron works. The steering yokes are brazed into this type of axle. In the rear, very heavy-walled steel tubing is used for the axle with a piece of cold-rolled steel brazed into both ends to give bearing surface for the wheels.

The blocks which support the engine are made from 2- by 3-in. ash and are held to the frame by clips which allow of their removal for adjusting the engine or chains. In my car I have constructed a countershaft about 6 in. to the rear of the engine and drive from the engine to the countershaft by one short chain and from the countershaft to the rear wheels by two extra heavy chains. The countershaft is mounted on Hess-Bright self-aligning ball bearings. The countershaft may be mounted on bronze or babbitt bearings as in the model A car, but ball bearings prove much more satisfactory.

Brake Drum Part of Wheel

The Houk wire wheels which I use fortunately are made with a flange on the rear hubs and a bearing surface on the inside of this flange, which I use as brake drums, having fitted up internal expanding brakes, Thermoid-lined, to stop the car.

The gasoline and oil tanks in this model are carried in the front of the car, the engine being placed on the side, giving ample room for the tanks and the body of the driver under the hood and cowl.

The steering-gear is a worm and gear type which I purloined from an old Overland that had gone to decay and which, with a little working over, made an admirable apparatus.

This type of car will cost anywhere from $100 to $300, according, as in the case of the model A, to the conditions under which it is built.

There are many things which the junior mechanic must work out for himself, petty details which would take a book to describe. These, however, can be settled with the aid of, perhaps, the garage mechanic or blacksmith. I am sure that there are many men who will give the youth who is trying to build one of these tiny creations every assistance possible in the matter of advice, and possibly, more substantially.

Interest in the tiny cars is growing rapidly and it is believed that in the near future the sport will have grown so that it will rival motor car racing in the eye of the public.

Transport Ravages of War

Retreat Increases Difficulty

PARIS, May 1—Since the German armies retreated from the Somme and the Aisne and the Allied forces followed them over the wrecked and desolated country, transport conditions have been more difficult than at any period in the history of the war. The effect of the advance has been felt in an immediate call from the British army for more mechanical transport officers to control the additional convoys put into the field. This call happened to coincide with a decision to the war department to transfer some of the younger men from the mechanical transport to combative branches of the service.

The obvious intention of the German general staff is to wreck the country so thoroughly that the failure of the transport services will prevent the Allied armies following up the Imperial troops. The work of destruction has been carried out with characteristic German thoroughness, for trees have been felled across the roads, mines have been exploded under the roads, and particularly at cross roads, houses have been brought down wherever they would form an obstruction, and the land at each side of the destroyed roads has been plowed up to such a depth that it is difficult for motor vehicles to pass.

Notwithstanding all the obstacles placed in their way, the motor transport services have made it possible for the English and French armies to follow up the enemy. At the earliest possible moment large numbers of soldiers were sent out to clear away obstacles, fill up shell holes and make conditions possible for convoys to pass. In the European sense of the word there are no longer any roads, but by a determination which is only rendered more firm by the sight of the wanton destruction, the mechanical transport men keep going and succeed in supplying the infantry and artillery with the food and ammunition necessary to carry on their pursuit.

The greatest indignation is aroused by the sight of the destruction wrought without any military necessity. In much of the reconquered country trees, hedges and other land marks are so obliterated that the French authorities have decided to put motor plows on the land and prepare it for crops without any thought as to its original divisions and ownership. Not a scrap of metal remains in the entire district. Even public statues have been taken down and shipped to Germany. In one village near Nesles, now held by the French, the Germans removed every piece of metal out of a factory, then took the owner prisoner on the pretext that he had hidden some copper. His daughter, who remained behind, received three offers of marriage from the German soldiers.

From information given by the inhabitants in the released districts, it is evident that the German armies are very seriously feeling the shortage of gasoline and rubber. When a certain number of trucks were sent out with a load and had to return empty, it was usual to make one of the trucks tow three others on the return trip, thus saving a certain amount of fuel. Very few German trucks are now fitted with rubber tires, the great majority running on steel bandages. It has been discovered that a large number of touring cars, formerly employed by officers in various branches of the service, have been laid up on account of the impossibility of obtaining tires.

TRADE AVIATION CONSIDERED

London, April 26—Great Britain is planning for aviation in trade. This announcement was made in the House of Commons to-day by Major J. L. Baird, representative in the House of the Aerial Advisory Board. The government has decided to appoint a committee under the chairmanship of Lord Northcliffe to investigate civil aerial transport after the war.

This committee would consider and report on steps to be taken for the development and regulation after the war of aviation for civil and commercial purposes from domestic, imperial and international points of view, and the extent to which it would be possible to utilize the trained personnel and the aircraft which at the conclusion of peace would be available.

NO BARRETT TRACTOR

In the April 26 issue of MOTOR AGE an account of a tractor test mentioned the Barrett tractor. This should have been Parrett. There is no Barret tractor, and this was a test with a Parrett tractor, made by the owner, J. P. Roth, and the Parrett Machine Co.

Electrical Equipment of the Motor Car

By David Penn Moreton & Darwin S. Hatch.

Editor's Note—Herewith is presented the forty-third installment of a weekly series of articles begun in MOTOR AGE *issue of June 29 designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the Class Journal Co., Chicago, in a size to fit the pocket conveniently.*

The fundamentals of electrical circuits of the motor car were explained through their analogy to water systems, and the relations of current pressure and resistance were brought out. This was followed by an explanation of series and multiple circuits, how electricity is made to do work in lighting, starting, signalling, etc. Calculating the capacity of a battery for starting and lighting and the cost of charging storage batteries and determining the torque a starting motor must develop were explained. Action of primary batteries and dry cells was considered. A section was devoted to the makeup and action of lead and Edison storage batteries, and another to the care of lead batteries in service and the best methods of charging them. Magnets and electromagnetism then were considered, and the principles of generators and motors explained.

Part XLIII—Switches and Protective Devices

THE primary purpose of a switch in any electrical circuit is to provide a means of controlling the operation of the circuit by opening and closing or completing the circuit just as a valve in a hydraulic circuit or pipe affords a means of opening and closing the circuit of which the pipe is a part. Electrical switches assume many different forms and sizes, depending upon the service for which they are designed primarily, which places certain requirements upon the switch in order that it operate successfully. Thus, a switch that is to carry a heavy current must be constructed with large contact surfaces in order that the resistance of these contacts be low; the surfaces of the materials which come into contact with each other must be smooth and should be in actual contact over as large an area as possible; the operation of the switch should be as positive as possible, and all connecting terminals and parts should be of ample size to meet the ordinary requirements to be imposed on the switch when in actual service.

In a great many cases certain parts of the switch are made up of a number of thin pieces of copper instead of one single heavy piece. This construction gives much better contact and also a surer contact in the majority of cases. A switch of this kind is said to be laminated. The selection of the material to be used at the breaking points of the switch will depend upon how severe an arc is likely to form, and the probable destruction or damage resulting from such an arc. The breaking contacts are in some cases made of carbon, but in the great majority of cases metal is used. Switches that are to carry a small current, such as those ordinarily found in the lighting circuits of a motor car, are much smaller, and require smaller contacts and smaller parts as a whole; but their operation should be quite positive to reduce the tendency for arcs to form at the points of contact when these contacts are being made and broken in the operation of the switch. If a switch is to be used in a high pressure circuit, such as the secondary circuit of an induction or ignition coil, it must be constructed in such a manner and of such materials that it easily will stand the electrical pressure to which it will be subjected under all ordinary working conditions. The construction of any switch is influenced greatly by the location in which it is to be mounted and the manner to be employed in operating the switch.

Quite often a switch is used to change the connection of the various elements of a circuit rather than to serve as a means merely of opening and closing the circuit. A good example of this requirement, as imposed upon a switch, is found in those systems where the connections of the various sections of the battery are changed from a multiple connection while the batteries are being charged to a series connection when the batteries are being used in operating the starting motor. In some cases a switch is introduced into a circuit merely for the purpose of reversing the connections of a certain part of the circuit wtih reference to some other part. Thus, in certain ignition systems we find what commonly is called a polarity switch, its purpose being to reverse the connections of the interrupter points with respect to the battery

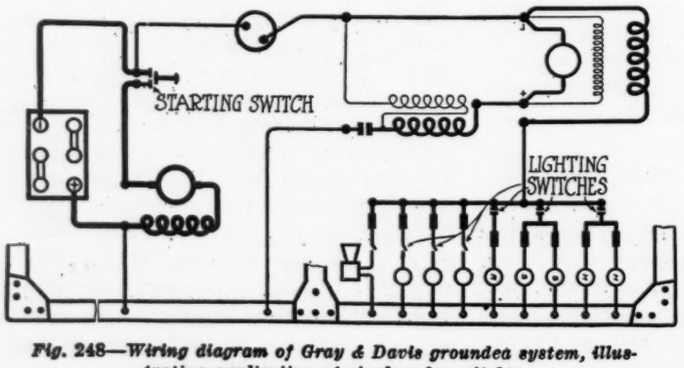


Fig. 248—Wiring diagram of Gray & Davis grounded system, illustrating application of single-pole switches

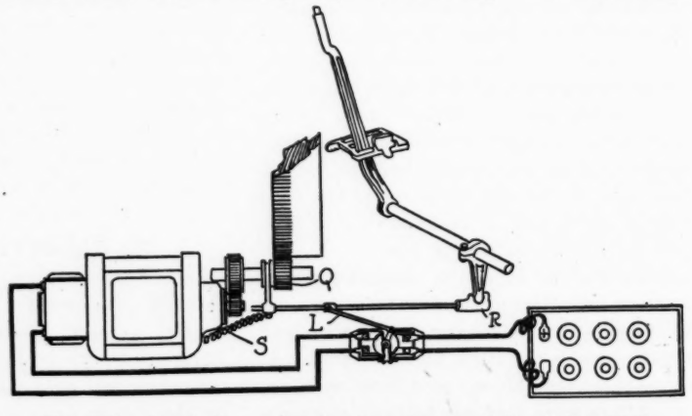


Fig. 249.—Connections of two-pole rotary switch on the 1913 Haynes car. The letters are for later reference

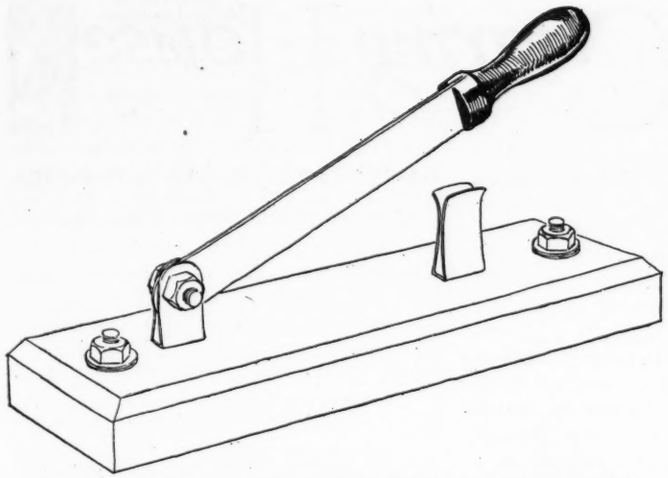


Fig. 250—Here is a common form of the single-pole blade switch

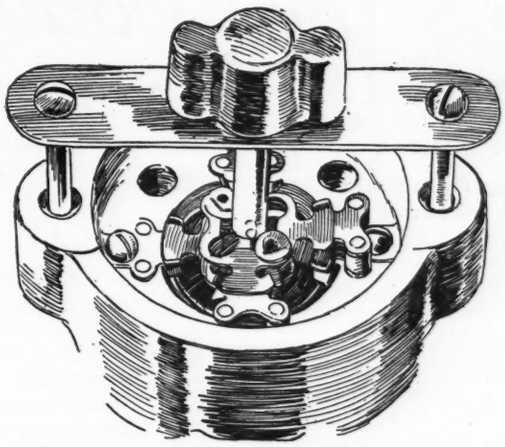


Fig. 251—Interior mechanism of two-pole snap switch

or generator in order that the wasting away of the two interrupter points may be equalized. If the direction of the current through an interrupter remains unchanged in direction, there will be quite a difference in the degree to which the two contact points are worn away. The metal naturally tends to travel in the direction of the current, and as a result there is a much greater wasting away of the positive contact than there is of the negative contact. An inspection of a set of contacts that have been in service for some time will convince you of this fact.

Single and Multipole Switches

A single-pole switch is one in which provision is made for opening the electrical circuit in which the switch is connected at one point only. An example of a switch of this kind is shown diagrammatically in Fig. 248. The positive terminal of the battery is grounded in this case, and the starting motor and its series field winding are connected permanently in series to the positive or grounded terminal of the battery. The starting switch is introduced in the lead connecting the negative terminal of the battery and one terminal of the armature of the starting motor. The lighting switches in this figure are also single-pole, and their connections are very similar to those of the starting switch. Current for the lights flows through the series field of the generator and serves to raise its voltage, which increases its output the required amount to take care of the lamps when they are turned on.

A two-pole switch is one provided with two sets of contacts. Two-pole switches may be so connected that one set of contacts is introduced in one circuit and the remaining set in another circuit, which really amounts to two single-pole switches mechanically connected together, and both circuits are operated at the same time. In the great majority of cases, however, the two sets of contacts of a two-pole switch are introduced in the same circuit, one set being introduced in one side of the line and remaining set in the opposite side of the line. A good example of a two-pole switch is shown diagrammatically in Fig 249, which represents the connections of the rotating starting switch on the 1913 Haynes car.

Multipole switches are those having more than a single set of contacts. A very good example of a multipole switch is found in early models of the Delco systems, in which the switch was used for connecting four sections of a storage battery in parallel for charging and in series for operating the starting motor.

Kinds of Switches

A blade switch is one in which the connection is completed by a metal blade which may be caused to move into contact with the side of a metal jaw or between two metal jaws. A common form of single-pole blade switch is shown in Fig. 250.

A snap switch is one in which the opening and closing of the electrical circuit, or circuits, which the switch is to control is performed by a snap action in the switch. This snap action is produced by a coil spring which winds up as the handle of the switch is turned. After a certain movement of the handle the spring is released and allowed to cause the contacting mechanism of the switch to rotate through a fractional part of a revolution. This rotation of the contacting mechanism is performed in a very short time, thus reducing the tendency for electric arcs to form at the points of make and break. An example of a snap switch is shown in Fig. 251, in which the switch cover is removed partially so that the interior is somewhat exposed to view.

A plug switch is one in which the switching action is performed by moving a plunger in or out of an opening in the top of the switch cover. This plunger may be made of metal or insulating material, and if made of metal it may form part of the electrical circuit when the switch is closed, though not always. The plug itself may be so constructed that it can be removed and the switch made inoperative until the plug again is inserted. Plug switches usually are confined to the operation of ignition and lighting circuits.

PHILIPPINES USE MORE CARS

Washington, D. C., May 12—The Bureau of Insular Affairs of the War Department, which has jurisdiction over customs matters for the island dependencies of the United States, in a statement on the import trade for 1916 of the Philippine Islands says that despite a depression generally due to the war, the motor car trade in the Philippines showed marked development. The report says in part:

"There was a 50 per cent increase in the number imported, and though the war was characterized by the usual condition of declining average price due to cheapening production and the increase in lower grade machines, the aggregate value of motor cars was materially larger than that of 1915, and there was also a marked increase in parts and equipment.

"Manila as an oriental distributing point for the American motor trade is indicated in exports of some importance of American machines to nearby countries. The growing use of the mtotor car in the islands is evident by a 50 per cent increase in the quantity of gasoline, which continued to be chiefly American, supplemented to a minor extent by the product of the Dutch East Indies."

NEW FIELD MOTOR

Grand Rapids, Mich., May 11—The Field Motor Co., capital $300,000, has taken the place of the old Field Motor Co., recently dissolved. The capital stock is divided into 50,000 shares, of which $250,000 has been subscribed. The stockholders are Byron E. Parks, Adrian M. Noorthoek, J. Palmer McVean, Edward A. Field, John H. Haven, Edward W. Gentz and John Sehlor. The company has started manufacture in its new plant and has a large business booked. The Field company manufactures a four-cylinder, double-opposed engine, using low-grade oil and fuels.

The Readers' Clearing House

TOO MUCH HEAT TO CARBURETER

Depending on Localities—Winter Driving Presents Troubles

Los Angeles, Cal.—Editor MOTOR AGE—In your April 12 issue a reader asked if it were possible to get the air too hot for proper carburetion when brought through a stove on the exhaust manifold. Your answer was in the negative.

My car is a 1916 Dodge, which has a stove cast into the manifold. It has a cold air regulator close to the carbureter. Soon after warming up on a long drive or on stiff hill there was a decided lessening of the power, that at times amounted to what seemed to be a complete lack of gasoline. Two or three weeks search for the trouble included the trial of a new carbureter, and a new vacuum tank. I finally removed the tube leading to the stove and several severe tests since then have proven that to have been the trouble.

With the tube on, the car uses engine distillate fully as well as gasoline. I am convinced that the hot air principle in many cases is being overdone. However, that is favorable to the use of low gravity fuel and is an economical advantage.—L. L. Lancaster.

This is a variable condition. What may hold good in one section of the country will not hold true in another section at all. In California where you live, you do not have to contend with the troubles brought about by extremely cold weather. In these northern states it is necessary to get all hot air possible to the mixture during the cold months. During the summer it is possible to cut down the supply of heat and get satisfactory results.

CRITICISMS ON PLANS FOR GARAGE

Show Room Too Small for Farm Machinery Display

Farley, Iowa.—Editor MOTOR AGE—Suggest plans for a garage 50 by 120 ft., one story, no basement, plans to embody the following: Construction 5 by 8 by 12, hollow tile for sides and end, same for front, fancy brick, plate glass front and 10 ft. on alley; foundation 12 in. concrete, 3 to 4 ft. in ground; floors cement throughout; roof round, frame, composition roofing; trusses 15 ft. apart; ceiling open 12 ft. from floor; light on east and south only; finestra window sash with wire or other glass as is best; half light in work room and one-fifth light on sides with two or three skylights for good measure.

2—Would you advise tile instead of a cement floor in the office?

3—Would you advise the use of part of the space over the office for a storage or vulcanizing room?

4—Is the office and display room too large for cars, plumbing, farm machinery, etc.?—Count Gibbs.

See Fig. 1. We suggest moving the accessory show cases, etc., to the other side of the room, and combining it with the repair parts and plumbing supplies stock, so that one person could take care of both. This arrangement would also make the office more accessible and attractive, and allow the stenographer or attendant to keep an eye on the front door, insuring visitors prompt attention. We would also suggest moving the vulcanizing room back into the repair shop, as the fumes from cooking rubber would be disagreeable in the show room where they would surely penetrate with the vulcanizing apparatus so close.

As to the hollow tile—a better size, in our estimation, would be 8 by 12 by 12, with piers of 12 by 12 by 12 filled with cement to carry the ends of the trusses. These piers should each have four ½-in. rods anchored in the foundation 10 in. apart, so they would extend up through their outer corners.

2—Tile would certainly be preferable to cement if style and appearance are to be considered. It would hardly be worth while, however, unless the office fittings, furniture and decorations would be of a quality in harmony with the tile.

3—We are of the opinion that the office and show room should be ceiled over, and if this is done, space between the trusses might be used to advantage. The open trusses would not be very attractive, and would make it impossible to heat this portion up to office temperature.

4—If you intend showing much farm machinery, your show room would seem too small rather than too large.

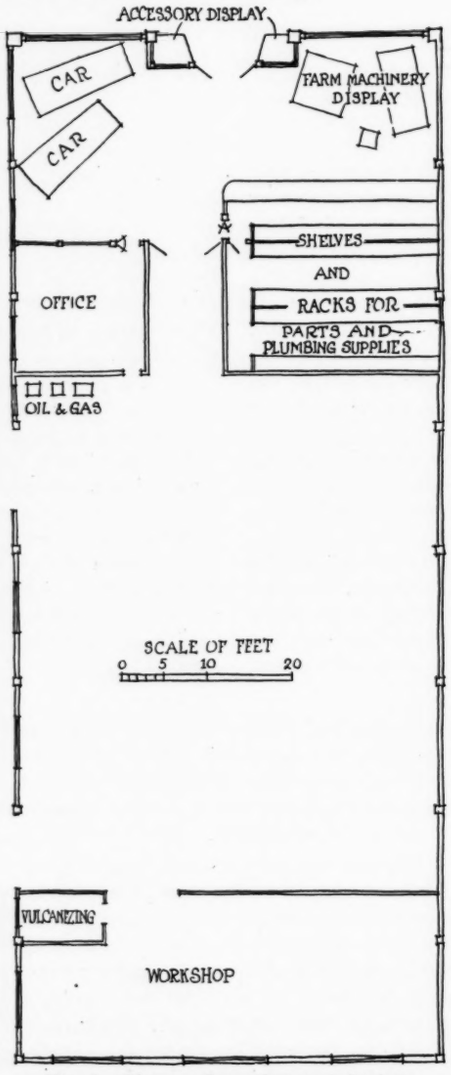


Fig. 1—Garage plans that include farm machinery display

HOW TO USE HORSEPOWER FORMULA

Purpose of Small Bevel Gears in Rear Axle

Owatonna, Minn.—Editor MOTOR AGE—Give firing order of twelve-cylinder engine.

2—Explain more definitely how to get the results of the following formulas and give example of each: "To find horsepower: Square diameter of bore and multiply by number of cylinders, divide by 2.5 gives horsepower at 1000 r.p.m."

"To find piston displacement: Square the bore, multiply by .7854 and result times the stroke."

3—Explain use of the little gears in the differential housing. Some cars have three and some four.—M. G. Wynn.

1—No. 1 right, No. 6 left, No. 4 right, No. 3 left, No. 2 right, No. 5 left, No. 6 right, No. 1 left, No. 3 right, No. 4 left, No. 4 right, No. 2 left, is a conventional firing, this being Packard.

2—Assume the engine has a 3-in. bore and four cylinders. Here is the formula, supposing that D equals the bore, N the number of cylinders and HP the horsepower:

$$\frac{D^2 \times N}{2.5} = HP.$$

$$\text{or } \frac{3 \times 3 \times 4}{2.5} = 14.4 = HP.$$

Suppose D equals the bore, S the stroke and N the number of cylinders, and PD the piston displacement. Assume an engine has a 3-in. bore and 5-in. stroke, with four cylinders. The formula is:

$$D^2 \times S \times .7854 \times N = PD$$

$$\text{or } 3 \times 3 \times 5 \times .7854 \times 4 = 141.3 = PD$$

3—These are the differential gears. Their purpose is to permit one of the rear wheels to go faster than the other when the car is turning a corner. When the car is being driven straight ahead the wheels are turning at the same speed and these small gears are inactive. However, when the car is turned about a corner and one of the wheels begins to turn faster than the other it is necessary that these small gears provide the flexibility necessary in the drive and they start to rotate in such a ratio that both rear wheels will be driving and still rotating at different speed. Those with three gears perform the same function as those with four. The only difference is on the design.

ON BUICK BEARING ADJUSTMENT

Two Ways of Getting at Connecting Rods and Pistons

Knoxville, Tenn.—Editor MOTOR AGE—Which is the most simple way to get to the connecting-rod bearings and piston rings of a 1914 model B-24 Buick engine, by removing the bottom of the crank case or by removing the cylinders?

2—Will it be necessary to remove the valves of this engine in order to grind them?

3—This engine is equipped with a Marvel carbureter, and when the car exceeds 3 m.p.h. the engine begins to miss, but runs good and has plenty of power otherwise. There seems to be no leaks in the intake manifold. What kind of

an adjustment should be made to overcome this trouble?—E. B. Halliburter.

1—There are two ways of getting at the bearings and rings in question. First, by removing the oil pan, next by removing the connecting-rod bearing caps and crankshaft-bearing caps and dropping the crankshaft. It will then be possible to pull the pistons out of the cylinders without removing the cylinders. Or this can be attained by removing the cylinders and oil pan and connecting-rod caps, but leaving the crankshaft in place. The latter way, our opinion, is by far the better, because of the fact that piston rings have to be fitted in the cylinder, and if the cylinder is removed, this can be done much more readily.

2—Valves, in order to be ground, must always be in removable condition. In other words, the springs must be removed so that the valves can be ground into the seats and then removed at frequent intervals for inspection. See the repair shop page of last weeks' MOTOR AGE.

3—The carbureter needs overhauling and possible altering to take care of the present low-grade of fuel. Send it to the makers for rebuilding.

MAGNETO IGNITION IS AT FAULT

Engine Picks Up When Switch Is Made to Battery

Higginsville, Mo.—Editor MOTOR AGE—I have a model thirty Buick roadster equipped with a Remy magneto and a model L. Schebler carbureter. It runs fine when running at the speed of 20 m.p.h., but when going up hill the car begins to slow down. It misses on the magneto but hits regularly when running on the battery, and when turning a corner it also misses on the battery the same as it does on the magneto. I had the magneto repaired some time ago and am under the impression that the points are not properly set.

Would like to have your advice; also the distance to set the points.—W. W. Mollenkamp.

If the engine picks up when you switch from the magneto to the battery, it proves that the trouble is not in the carbureter, but in the magneto ignition. If both battery and magneto work on the same set of plugs it also proves that the latter are all right. The chances are your magneto has become partly demagnetized and generates sufficient voltage for a spark only at high engine speeds. Better send it to the makers to be looked over. Ignition failures are often due to a weak, run down or polarized battery. A defective mixture will often occasion misfiring on account of difficulty of ignition.

The correct adjustment and shape of the contact-breaker points which will apply to most high-tension magnetos is shown in Fig. 2. Theoretically the distance between the points should be the same as that between the points on the plugs.

Regarding Aluminum Manifolds

Genesco, Ill.—Editor MOTOR AGE—What is the bore and stroke of the Flanders 20 and Haynes model 19?

2—What is the engine speed of each?

3—What is the speed of each car?

4—Will an aluminum manifold give more speed and power than a still one? If so, how much?—M. W. Ward.

1—Flanders, 3⅝ bore, 3¾ stroke. Haynes model 19, 4¼ bore, 5-in. stroke.

2—These cars were built before the days of accurate dynamometers for engine speed testing, and there are no available records.

3—Because of the ages of the cars and the further fact that there were no official tests for speed made, it is not possible to give a fair figure.

4—It depends entirely on the type of construction. A steel or iron manifold, if designed properly, is just as efficient as an aluminum one, possibly more so.

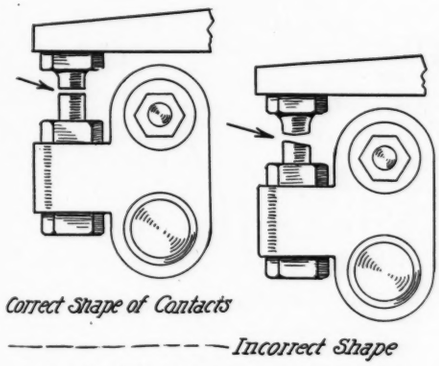


Fig. 2—Correct and incorrect shapes for magneto contact points

Reader's Car Idea

Grand Forks, N. D.—Editor MOTOR AGE—I send you the drawing of a car which, I believe includes the three prominent features in cars at this year's shows. See Fig. 3. You will find the car drawn to contain the following features:

1—The so-called deck.

2—To be without running boards.

3—The racing type exhaust.

I am sending this drawing because I believe a practical car can be built along these lines.—Boyd W. Begg.

Ammeter Wires Crossed

Wellsburg, N. D.—Editor MOTOR AGE—My storage battery has a leak around one of the filler plugs. What can I use to seal it? Is sealing wax all right?

2—Why does the indicator hand on the ammeter of a 1916 Overland six, autolite system, travel to the discharge side as far as ten when running at charging speed and when the engine is slowed up it comes back to center and then shows a small charge when engine is running below charging speed? How can I remedy this?—J. B. Williams.

1—We assume that you have a rubber topped battery with rather high plates and that you are carrying it a little too full. There is no satisfactory method of sealing and the only thing to do is to look at the battery oftener, probably once a week, and be careful of the level.

2—It appears that the wires to the ammeter are crossed. Change these wires one for another, that is, fasten each to the opposite terminal and the instrument will register correctly.

HE BREAKS PORCELAINS IN PLUGS

Probably Due to Overheated Engine—Look to Cooling System

Miami, Ohio.—Editor MOTOR AGE—I have a model 86 Overland which uses a Continental engine six-cylinder rated at 45 hp. It seems as though I have a great deal of trouble breaking porcelains in the plugs, which I think is due to excessive heat for the kind of plug used, and when I have one porcelain broken in this engine and have a pull on a grade about a mile long, the engine back fires as though short of gas; at this time I can pull the switch and the car will run on one or two cylinders just the same, and seems as though the car overheats and ignites the gas. What I would like to know is, Why does one broken porcelain put the rest of the cylinders out of commission? Explain fully.—E. Z. Gieringer.

Your trouble evidently is in the cylinders, overheating causing pre-ignition. A common cause for an engine running with the switch open is red-hot plug points or overheated cylinders. It may be that your cooling system is not functioning properly. Too rich a mixture, carbon deposits, tight bearings, defective cylinder lubrication and loose fan belt all tend to make an engine overheat. Check up on these points and make sure they are right. Then install a new set of plugs, after which your troubles should disappear. The broken porcelain you mention probably does not put the rest of the cylinders out of commission so much as the above mentioned conditions of the engine do. In other words, the breaking of the porcelains is incidental to these conditions.

HIS CAR NEEDS ADJUSTMENTS

Can Check Valve Lift By Stem and Lifter Clearance

St. Louis, Mo.—Editor MOTOR AGE—I have a Saxon Four roadster, with factory date of August, 1914. What should the compression pressure be in this engine?

2—It is equipped with a special Mayer carbureter, which has leaked for over six months, the gasoline continually running down off the handle of the needle valve. There is a small air vent the size of a pinhead, about ¼-in. from needle valve, which the oil appears to run through. The first two years I had no trouble but the last year when the engine is running, the oil drops off the handle of needle valve in a stream. I have had carbureter off and cleaned it. Have had a garage man go over it. He said the needle valve did not seat properly and ground same down, but it still leaked. Then I took it to my dealer who put new packing around the needle valve and lowered the float valve. It still leaks. Can it be on account of the heavy oil now used? Would you advise a new carbureter of more efficient make?

3—Makers of the car say the valves have a lift of ¼-in. How can I check the lift or clearance best, as I am informed much loss of power comes from improper adjustment of push rods.

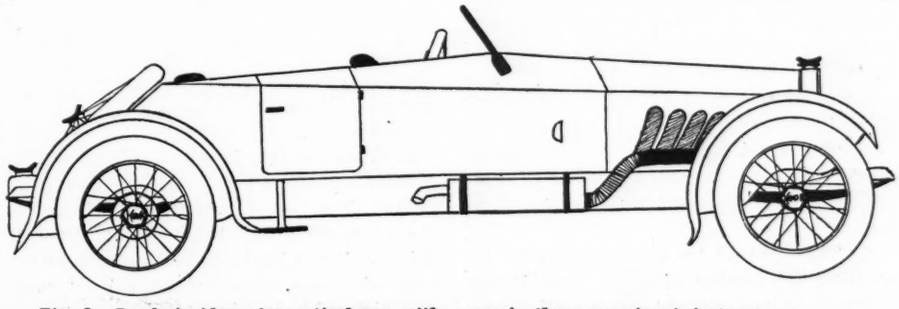


Fig. 3—Reader's idea of practical car with season's three prominent features

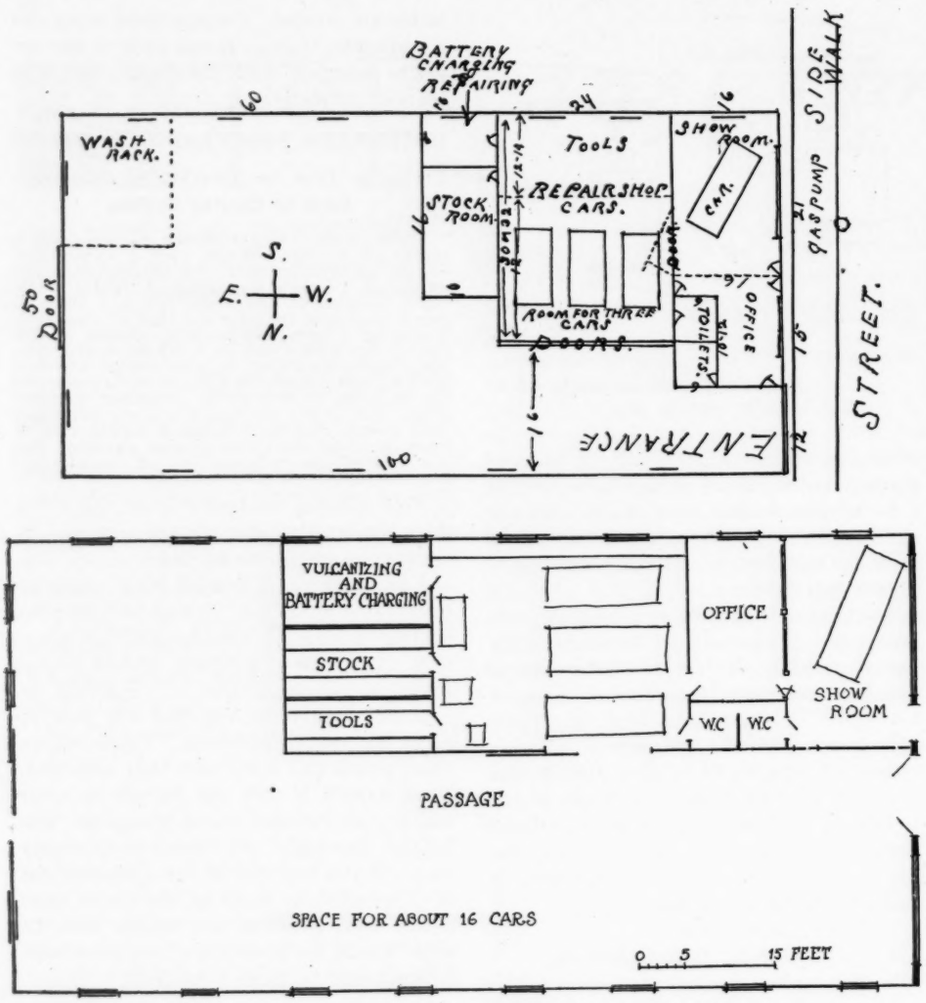


Fig. 4—Reader's and critic's plans for garage 50 by 100

At present I can get very little power from the engine.

4—The main leaf spring on the front axle is broken. Would an extra main spring—making a double main spring from axle to frame—stiffen the spring too much and make riding hard?

5—This car is run on six dry cells. Would there be any advantage in increasing the cells to say, eight, ten or twelve? Would it increase the intensity of the spark and lengthen the life of the cells?

6—The left rear wheel of my car oscillates or wabbles from top to bottom. What is the cause of this, and is it dangerous except for the extra wear on casing?—W. B. Buffington.

1—About 55 lb. gage.

2—We would advise a modern carbureter—one which is adapted to handle the present low grade of fuel. As to the make we can offer no preference.

3—You can check the amount of lift and thus the proper adjustment by the distance between the push rod and the valve stem. This should be about .004 in., or about the thickness of an ordinary calling card. If all valves are set with this clearance they will be in proper adjustment, providing the cams themselves have not become unduly worn, which we do not think is the case.

4—The extra main spring you suggest would make the car very hard riding. Better stick to the present method of springing.

5—There would be no advantage in increasing the number of cells. Even if you did reduce the current consumption per cell, the natural deterioration of the cell and consequent loss of power would about compensate for the difference.

6—Either the bearings within the wheel are worn, the drive shaft is bent, or the wheel itself has become out of true. It should not be permitted to exist. It inflicts a strain on the driving mechanism.

Haynes Wiring Diagrams

Peru, Ind.—Editor MOTOR AGE—Show by diagram the wiring system of the Haynes light six and also of the Haynes light twelve.

2—How much speed is a Reo six model M. supposed to make?—Glen Mattox.

1—Shown in Figs 6 and 7.

2—There is no official record of the speed, nor a claimed speed by the makers.

No Best Dimmer Known

Arkansas City, Kans.—Editor MOTOR AGE—Is it necessary to equip a car having pressure-system gasoline feed with a differently-designed carbureter when changing this to the vacuum feed system?

2—What is the best dimmer in connection with headlights, a lens that will concentrate light on driveway, or a lens that will diffuse the light? I am partial to light concentrated on the driveway in preference to dimmers or diffusion of light.—C. D. Lockwood.

1—No.

2—This question is still a subject of discussion. Both types have bad and good points. The concentrated beam deflected to the road gives the better light for fast driving, but is likely to be thrown into the eyes of others when not on a level road. The diffused beam gives the least glare and best roadside light, but not as great distance illumination.

WOULD HAVE SHOWROOM NOISELES

Criticism of Garage Plans Advises One End Entrance Only

Oseo, Ill.—Editor MOTOR AGE—Am planning a garage and inclose two drawings (1) of part of town, (2) a plan of a garage. What suggestions and corrections can you give for the arrangement of garage inside? The town has about 800 inhabitants, 100 miles north of Kansas City on the main line railroad, Chicago to Kansas City. There are two trails through town, the S. W. and C. K. C. & G. We have electric lights, 24-hr. service, no waterworks and one other small repair shop.

Garage—location and size, 50 by 100, settled. Will likely have one row of posts through the center, 20 ft. apart, first post at the west end, 4 ft. off. The garage will be about one and one-half blocks from the main business part of the town. Unsettled questions—agency for cars, showroom, entrances, where and how many entrances may be had on east end without any trouble. Which end for front? Gasoline pump at curb. Repair shop partitioned off from rest of garage.—Charles F. McClain.

We would suggest that you change the plan slightly and, instead of having a row of posts through the center, have a continuous partition, with a passage alongside this, which will leave plenty of room to park a continuous row of cars from front to back, all being accessible at all times. The dimensions of the other divisions have not been changed materially, but the office is put behind the show room to separate it from the repair shop, where the noise of machinery and pounding and smell of hot grease, etc., might have a detrimental influence on a possible customer. It might even be advisable to interpose the stock and tool rooms also as an additional sound arrester. We cannot see the objection of having an entrance at both ends, and if there is any advertising to be gained by a view from the railroad station, we would think the main entrance should be at the rear, or east, end rather than on an unfrequented side street. An electric sign would be a good feature, placed so that it could be seen from the main street—possibly on top of the building.

How to Build Junior Car

Troy, N. Y.—Editor MOTOR AGE—I am interested in miniature racing cars. Give addresses of companies who construct these cars.

2—Are there any firms who make and sell parts and plans so that I could construct a junior car?—Ralph Stubblebine.

1-2—To our knowledge there is no company manufacturing these cars. You will find in this issue, part 3 of the article "The Junior Racing Car, Its History and Construction," by Harry H. Hartz, which is the conclusion of the article begun on page 28 in the May 3 issue of MOTOR AGE. This article will give you a good idea as to how these cars are constructed.

Mysterious Knock in Buick

St. Leo, Minn.—Editor MOTOR AGE—I have been unsuccessful in locating the knock on a Buick Model D.-44. When driving at about 25 m.p.h. on a level road it is not noticeable or when ascending a hill, but when driving faster a continual knock is apparent on the camshaft side. Can you explain it?—Mathias Hugebach.

The knock is very probably in the valve mechanism. It may be what is known as a valve slap—a noise created by a valve dropping upon its seat, or it may be that the valve lifter guides are loose so that

there is play in that part. Another source may be in the oil pump. If the noise is rather loud and of a metallic sound it may be a piston slap, due to a piston fitting poorly within the cylinder.

PECULIAR TROUBLE IN SPLITDORF

Probable Cause is in Cam—Remedy Replacement

Chillicothe, Iowa—Editor MOTOR AGE—We have a Splitdorf Dixie 40 magneto on an Overland 83 which has been giving trouble for some time, and we cannot locate the trouble. It produces two sparks per revolution. One spark is good, the other weak; this makes every other cylinder miss. We have changed from Splitdorf plugs to another kind with a slight improvement, but the trouble continues to make the running disagreeable. We have changed wires, the brushes are good, and are sure it is beyond the distributor. The platinum breaker points become fouled quickly. We have them as flat and smooth as possible and tried a variety of adjustments. It will arc or spark at the points at a difference of speed on an adjustment for normal speed. We have made every test and changed or alternated the timing, and the weakness continues from the same terminals; that is, from cylinder 1-4 to 2-3. The same kind of symptoms appear on another car of the same make and magneto.

Can you tell us what may cause this?

Is it a weakness of some part of the magneto that may be replaced, or could it be some part that could need adjustment or cleaning?—M. L. Dickson.

It would appear that one point of the cam on the end of the shaft is lower than the other, giving an irregular opening to platinum points with the result that there is a proper spark in one place and an improper one in the other. The remedy is replacement of the cam with a new one and proper alignment of the points.

Attention in the above manner plus proper adjustment and cleaning should be all that is necessary to remedy the trouble. The removal of Splitdorf plugs for another make would serve no useful purpose, as the changing of plugs has nothing to do with improving the source of ignition current.

Saxon Roadster Ammeter

Kellettville, Pa.—Editor MOTOR AGE—Give diagram for wiring an ammeter on a Saxon roadster, Model 14.—F. J. Henderson.

The diagram is shown in Fig. 5.

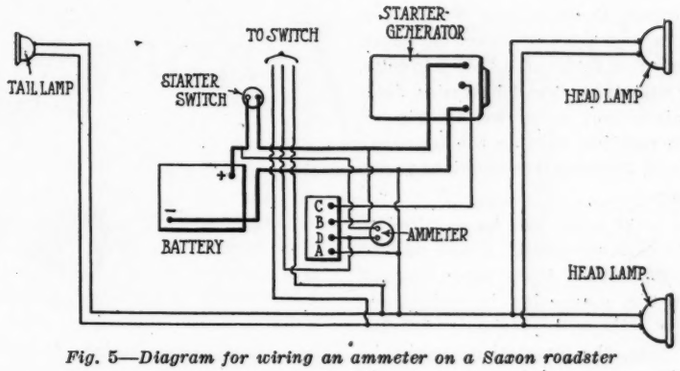


Fig. 5—Diagram for wiring an ammeter on a Saxon roadster

New Engine Overheats

Cushing, Okla.—Editor MOTOR AGE—Should a new engine overheat after being driven 1300 miles?—E. W. Pulliam.

After a car has been driven 1300 miles it may have collected enough carbon in the cylinders to cause overheating. There may be trouble in the circulating system. The valves may be improperly adjusted so that they do not open wide enough. If it has been driven that distance and everything is in proper adjustment and the engine clean it should not overheat.

Exhaust-Valve Springs Heavier

Crawford, Ga.—Editor MOTOR AGE—I notice on the Maxwell Junior two of the valve springs are stronger than the other two. Where does the strong spring go, on the intake or the exhaust, and what is the object in not having them all the same tension?—M. C. Armel.

The valve springs are stronger on the exhaust than on the intake, for the reason that the valves on the exhaust side must be closed against greater pressure than those on the intake.

Inquiries Received and Communications Answered

L. L. Lancaster.....Los Angeles, Cal.
Count Gibbs.....Farley, Iowa
M. G. Gwynn.....Owatonna, Minn.
E. B. Hallburter.....Knoxville, Tenn.
W. W. Mollenkamp....Higginsville, Mo.
M. W. Ward.....Genesco, Ill.
Boyd W. Begg.....Grand Forks, N. D.
J. B. Williams.....Wellsburg, N. D.
E. Z. Gieringer.....Miami, Ohio
W. B. Buffington.....St. Louis, Mo.
Cohen Mercantile Co...Woodville, Miss.
Glen Mattox.....Peru, Ind.
C. D. Lockwood....Arkansas City, Kan.
Charles F. McClain.....Oseo, Ill.
Ralph Stubblebine.....Troy, N. Y.
Mathias Hugebach.....St. Leo, Minn.
M. L. Dickson.....Chillicothe, Iowa
F. J. Henderson.....Kellettville, Pa.
E. W. Pulliam.....Cushing, Okla.
M. C. Armel.....Crawford, Ga.
Austin Dozier.....Austin, Tex.
Jonesboro Supply House.....
.....Jonesboro, Tenn.
Kenneth Dolph.....Hastings, Iowa

FORD MAGNETS CHARGED IN CAR

Storage Batteries, Dry Cells or 110 V. Direct Current Used

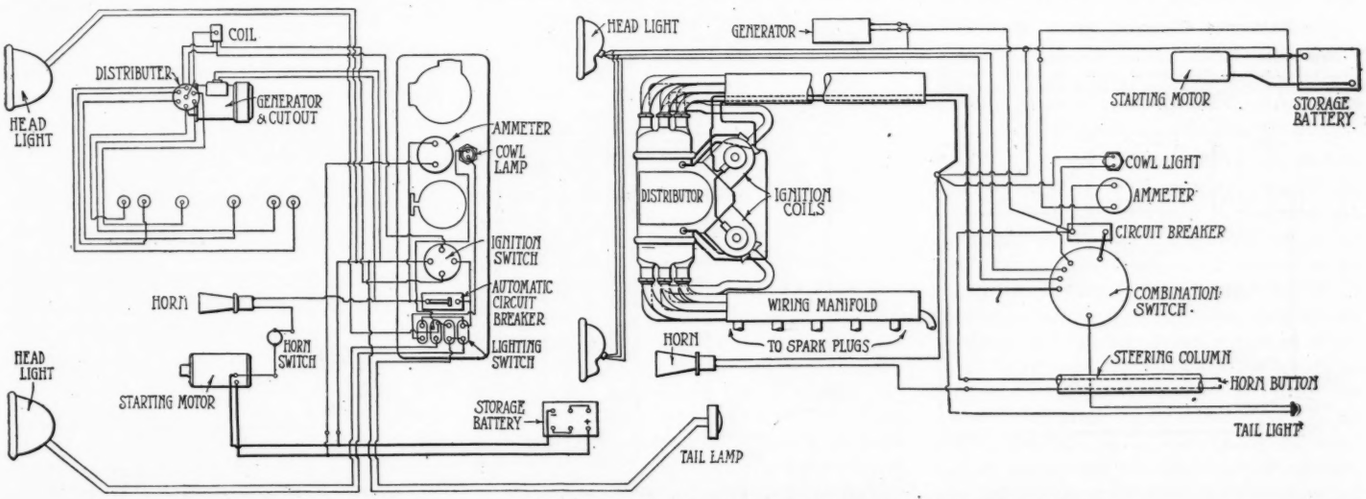
Austin, Tex.—Editor MOTOR AGE—Explain method of recharging a Ford magneto without tearing down the engine.—Austin Dozier.

The problem of remagnetizing the Ford magnets without removing them from the car is simply a case of getting these magnets properly placed and sending sufficient current through the coil to produce saturation of the magnets.

Here is the way you should go about it to place the magnets properly. Remove the floor boards. Have the car facing either east or west. Measure a point about 1¼ in. to the left from the center of the terminal. This point should be marked on the case. Place an ordinary compass squarely in back of this point and about 3 or 4 in. back of the top of the magneto case. Now have the engine turned over very slowly. When the north or N point of the compass points directly at the mark stop turning the engine over.

With this setting the magnets are properly arranged. The S pole of one of the magnets is square behind the first coil, and each magnet pole is back of a coil. The next proceeding is to energize the magnets, and this may be done in several different ways.

Before energizing, the magneto wire should be removed from the terminal. One



Figs 6-7—Wiring diagrams of the Haynes light six, left, and the Haynes light twelve, right

way is to secure three or four 6-volt storage batteries and connect them in series. This will give a total of 18 or 24 volts. The wiring with three 6-volt batteries, fully charged, mind you, is shown in Fig. 8. Connect the positive wire to the terminal, and then touch the negative terminal to the engine frame.

About 24 to 30 amp. will be required to energize the coils properly. There will be no harm done with a little more current, although if the connection is maintained too long the coils will overheat with the possibility that the insulation would be damaged. The most satisfactory way is to make and break the ground connection five or six times, leaving the connection closed about a second each time.

Dry cells can be used as a source of recharging current. It will take at least forty-eight of them strung up as shown in Fig. 10, connected in series-multiple, with sixteen cells in series. The combination will give about 24 volts, and if the cells are fully charged, in fact new, there will be sufficient current for a satisfactory job.

If one has a 32-volt direct-current generator it can be connected directly to the magneto without any resistance in the circuit. The charging process is carried on as described above.

Direct city current of 110 volts can be used for the work in conjunction with a bank of lamps, or a resistance coil. Alternating current cannot be used unless it is transformed to direct current by a rectifier.

A layout for a lamp bank is shown in Fig. 11. It will be necessary to use twenty-five or thirty 32 c. p. carbon lamps. A 3 ohm resistance coil will have the same effect. These can be purchased, or easily made. Wiring for this charging method is shown in Fig. 12.

Such a coil can be made out of about 13 ft. of No. 16 nichrome resistance wire, or about 8 ft. of No. 18. Then, too, one can use 18 per cent German-silver wire, which will require about 35 ft. of No. 16, or about 22 ft. of No. 18.

Batteries Charged by D. C.

Woodville, Miss.—Editor MOTOR AGE—Give diagram and instructions how to build board with lamps for charging storage batteries with direct current. Should lamps be wired in series or multiple? We have ammeter and voltmeter. —Cohen Mercantile Co.

Descriptions of devices which will meet with your needs will be found in the Readers' Clearing House section of the May 3 issue of MOTOR AGE.

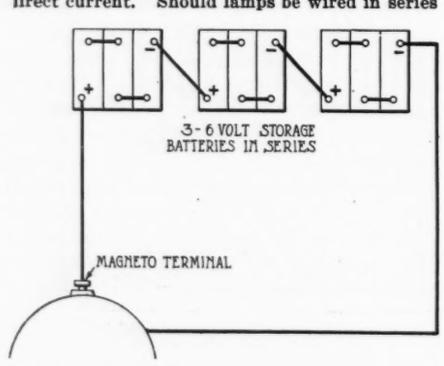


Fig. 8—Wiring with three 6-volt batteries fully charged

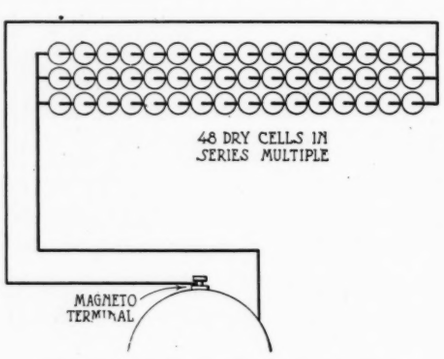


Fig. 10—This combination will give about 24 volts

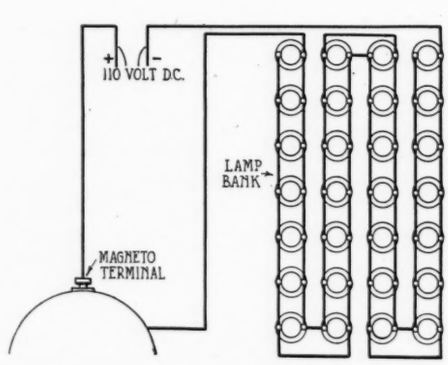


Fig. 11—Layout for a lamp bank, indicating number of lamps

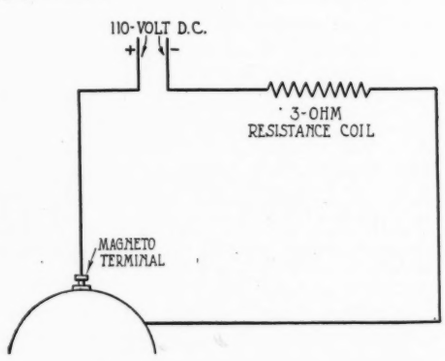


Fig. 12—A 32-ohm resistance coil that may be used

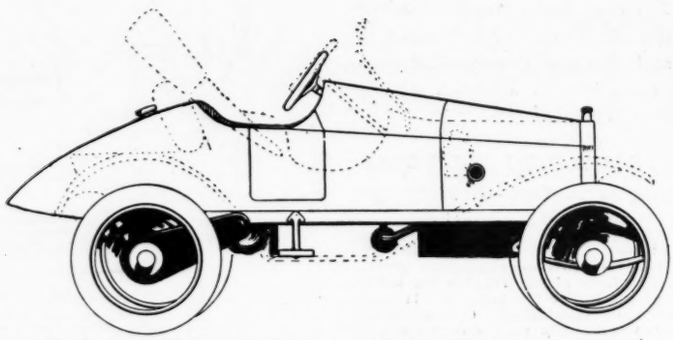


Fig. 9—Metz 22 converted into a speedster with seat and steering post lowered as much as possible

METZ 22 MADE INTO A SPEEDSTER

Cannot Lower Frame at Cost Within Value of Car

Hastings, Iowa—Editor MOTOR AGE—Publish diagram for converting my Metz 22, purchased in 1913, into a speedster. I want the seat just as low as possible and steering post lowered.

2—Could I do this without special tools, or could a body be purchased?

3—Is the friction drive used in this car considered satisfactory. Are two drive chains on a chain-drive car better than one?

4—Would aluminum pistons increase the speed?

5—Is there any way of lowering the entire frame of this model?

6—Could I construct the car so the hood would come up close to the steering wheel and the back end covered tapering to a point?—Kenneth Dolph.

1—Shown in Fig. 9. The seat cannot be lowered much because of the friction disk. This must be the major consideration in lowering the seat. Thin leather cushion without springs will assist in lowering the seat to a minimum.

2—We know of no one making such a body. As far as tools are concerned, it would require ordinary sheet-metal working equipment. Construction of such a body is out of the hands of a total amateur in sheet-metal working.

3—Yes. One chain, of the type used, is sufficient.

4—Yes, if properly fitted.

5—Not within a price figure which would be anything but exorbitant.

6—As shown in the sketch.

Who Makes This Body?

Jonesboro, Tenn.—Editor MOTOR AGE—We have a customer for either a car with the following type of body, or for the body only. I would be interested only in car with this type of body retailing around $1,250, or under.

Body to have sloping windshield, top to be either stationary, or so as to be let down; preferably designed to be arranged with a top that will take down, being similar to one made by the Paige people, their Brooklands, which is supported by uprights that can be detached and the top rolled up.

The front seat to be capable of holding three passengers and a divided section to be lifted out as in the case of the Briscoe.

Glass drops for the two front doors, and the sides of the tonneau.—Jonesboro Supply House.

From the Woman's Viewpoint

Illinois Women Organize for War

THE women of Illinois are organized for war, whether it be motor service or more static.

Two hundred women were present at the meeting of organization held in Chicago the latter part of last week to form a central committee. This committee is to represent all the women's organizations of the state, which will have general direction of all feminine activities of wartime nature.

It takes quite a memory for anyone to be able to give the title of this woman's defense council first call. The name was suggested after telegraphic advices from Washington and is:

WOMAN'S COMMITTEE OF NATIONAL COUNCIL OF DEFENSE, ILLINOIS.

You see from this that the committee is not merely a local organization. It is more than that. It is national, and as such a much more important future for it is promised.

The call reads, "To avoid duplication of effort; to utilize organizations already in existence; to promote efficiency and give every woman an opportunity for patriotic service at home or abroad."

This, then, is the object.

Governor's Wife Is Chairman

Mrs. Frank Lowden, the wife of the governor of Illinois, and Mrs. Antoinette Funk and Miss Agnes Nestor, the two latter representing Illinois on the national council of defense, were chosen honorary chairmen of the Chicago committee. Executive officers of the state committee were elected as follows: Chairman, Mrs. Joseph T. Bowen; secretary, Mrs. George W. Plumber; treasurer, Mrs. Cyrus Hall McCormick; director, Mrs. Ira Couch Wood.

Permanent headquarters have been opened with the director and a staff of assistants in permanent charge. They are ready and anxious to answer all inquiries from organizations of women or individuals as to how and where they can best help the country in the present crisis.

A uniform registration fee of 10 cents will be collected from every woman who puts her name down for work in any department of the committee's activities. Large contributions are being accepted, of course, from women who wish to help pay the running expenses of the work.

The central committee will issue uniform registration cards after the model of the National Council of Defense, and send them to all the organizations of women in the state. Further registration is to be made by each club from its members.

Once enrolled each woman can do her bit as she wishes. Among the many opportunities already outlined are keeping up local charities; food production, farming and gardening; hospital supplies, comforts for soldiers and sailors, public health, inspection, care of enlisted men's families.

Another organization in which the Chicago women are interested now is that organized "to aid in the prosecution of war and in the administration of war relief." This is called the citizens' war board of Chicago, and both men and women are members. The board of directors contains two women and thirty-two men, one of the women being Mrs. Ira C. Wood, director of the central committee, the other being Mrs. Gertrude H. Britton.

Mrs. Wood is having all kinds of positions heaped upon her in the national work for defense. As if these two positions were not enough she was chosen executive secretary of the woman's committee of the national council of defense, and went to Washington for her new position. Miss Harriet Vittum was elected director of the woman's committee of the national council of defense, Illinois division.

Permanent headquarters for the Illinois division have been opened at 60 East Madison street. Several names have been added to the advisory council since the organization, among them that of Mrs. Franklin Martin, whose husband is on the National Council of Defense in Washington. Practically every womans' organization now is enrolled, and as fast as new ones are discovered it is the wish of Mrs. Joseph T. Bowen, the chairman, that they join.

How Western Girls Staged Fallon Sink

FALLON SINK—for the benefit of the motorist who has escaped it—is a strip of road in Nevada in which everything but alkali and sand is mired. It is the only real blot on the Lincoln highway, and Northern California objects seriously and effectively, as it turned out. It determined to raise $50,000, and $10,000 in Alameda county in which Oakland is situated.

Here's where the girls come in.

The Oakland Chamber of Commerce issued a call for pretty girls. The girls and everybody else then turned to with picks and shovels and reproduced Fallon Sink on one of the boulevards. Dirt, mud and gravel, was dumped on the pavement until the motorist had to literally wade through. And then 100 of the girls took their places on each side. No motorist got by with less than $1 swelling the fund. The day netted $2,000.

War Committee to Help Women

THE national board of defense has appointed a committee on women in industry to prepare the way for women workers in munition and other war product plants. The idea is that the United States should profit by the mistakes of England, also by guarding its women workers.

Miss Mary McDowell, head resident of the University of Chicago settlement house, a member of the committee and chairman of the subcommittee on alien women, according to the Chicago Tribune, says that the speeding up in the English factories decreased the output of munitions instead of increasing it, as the pace was too fast and factory conditions for the women were so poor that there was a vast amount of sickness, while many of the women broke down and had to give up work entirely.

Motor Bus Joys In Spite of War

CHICAGO'S motor buses are as yet very novel creations that roam the boulevards. There are all kinds of rides and parties given atop the gorgeous vehicles, and the other day there was one of these parties de luxe, for even the motor bus company joined in.

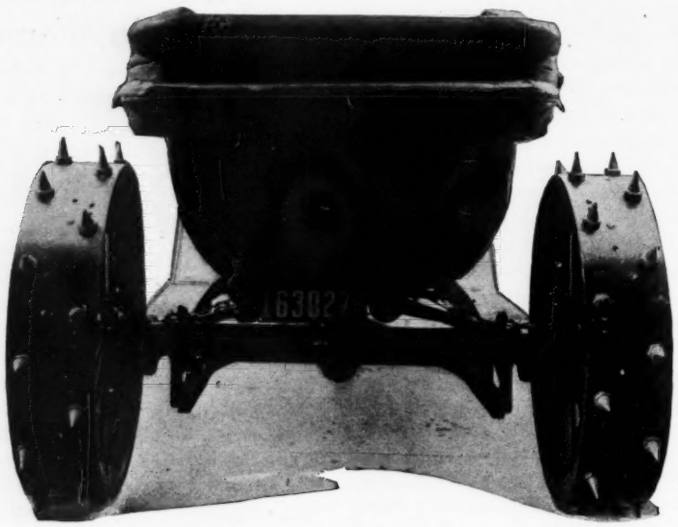
Miss Emily Larned of Chicago is given a good deal of credit for bringing the motor buses to Chicago. The bus company offered Miss Larned one of its vehicles for an entire afternoon to transport a party of friends anywhere in the city. Guests were invited for every one of the seats, and the University of Chicago was made the end of the journey southward. The entire party was asked to take tea with President and Mrs. Harry Pratt Judson at the university.

National Council Pledges Services

THE National Council of Women met in Chicago recently and decided to devote most of its activities to war service. A message offering the co-operation of 7,000,000 women represented was sent to President Wilson. Miss Kate Davis of Cleveland, Ohio, who has been largely responsible for the war organization of women in Ohio, and for work among children, led the movement to send a letter to the governor of every state, advocating the organization of work for those between eleven years, and the conscription age for war service along industrial, vocational and agricultural lines.

Smith Form-A-Tractor Equals 5 Horses

Will Pull Two 14-In. Plows, Set 7 In. Deep 2¾ M. P. H.—Sells for $255



Rear view of the Smith Form-A-Tractor, showing spiked wheels and method of attachment

SIMPLICITY marks the construction of the Smith Form-A-Tractor with which a Ford car is converted into a utility tractor that will do the work of five horses. Experiments of eight months' standing have proved to the manufacturer, the Smith Form-A-Tractor Co., whose main offices are at 1603 South Michigan avenue, Chicago, and factory at Clearing, Ill., that the attachment is capable of pulling two 14-in. plows 2¾ m.p.h with the plows set 7 in. deep.

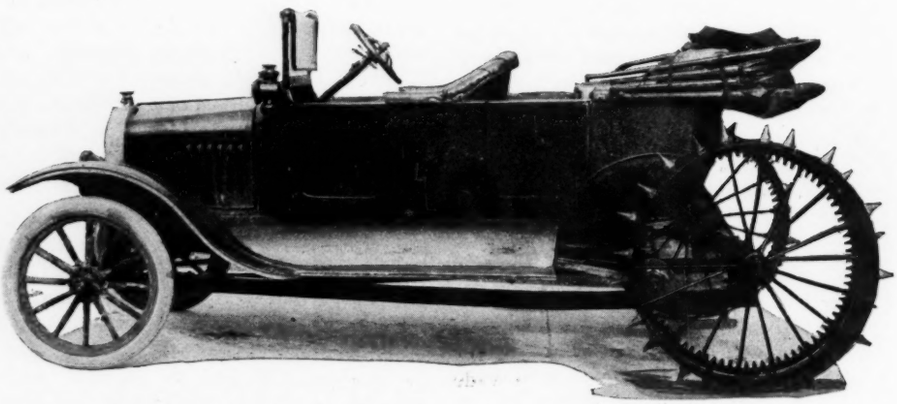
The attachment consists of a channel section frame which attached to the Ford front axle extends under the Ford chassis beyond the rear axle and is connected with a dead tractor axle made of 2-in. cold rolled steel, designed to receive two tractor wheels with 10-in. face and 42-in. diameter. The wheels are spiked with twenty-seven conical lugs to the wheel.

Attachment is made in 15 min. without boring a hole or changing the mechanical construction of the car in any way. The wheels of the car are removed and in their place is put roller driving pinions having a keyway to fit into the key of the Ford axle. The driving pinion fits over the brake drum and each pinion has six rollers, which may be replaced when worn at 15 cents a set.

The tractor wheels have a bull gear made in eight sections, the teeth of this gear meshing with the roller driving pinions and giving a gear reduction of 48 to 1. Inasmuch as the tractor axle is back of the Ford rear axle, the tractor wheels are pushed down, affording a down thrust which gives greater traction with no waste power or strain. The side members of the frame are bent inward at a point a little beyond the muffler of the Ford, converging at the front axle to which they are attached by means of a bracket. Two push rods extend from the tractor axle to the housing of the Ford rear axle so that the car is pushed ahead by the tractor movement.

In addition to this attachment, which sells for $255, there also is included a special cellular type radiator that is about six times the capacity of the regular Ford radiator. This is necessary since the tractor travels at low speed while the engine is operating at 1000 r.p.m., or a speed to operate the car at 20 to 25 m.p.h. Besides, there is included a Strong sight-feed oiling system located on the dash. The radiator and oiling system, of course, remain on the car at all times, but no other part of the attachment does. A wheel puller also is included.

The production schedule for the first six months is 30,000, delivery having begun May 1. L. C. Perkins, formerly of the Perkins Mfg. Co., Des Moines, Iowa, is general manager of the new concern and E. I. Rosenfeld, president of the Smith Motor Truck Corp., also is president of the Smith Form-A-Tractor Co.



Side view of the Smith Form-A-Tractor. Note the subframe extending to the front axle. The full gear in the driving wheels comes in section and can be replaced for $1

NEW DULUTH INDUSTRY

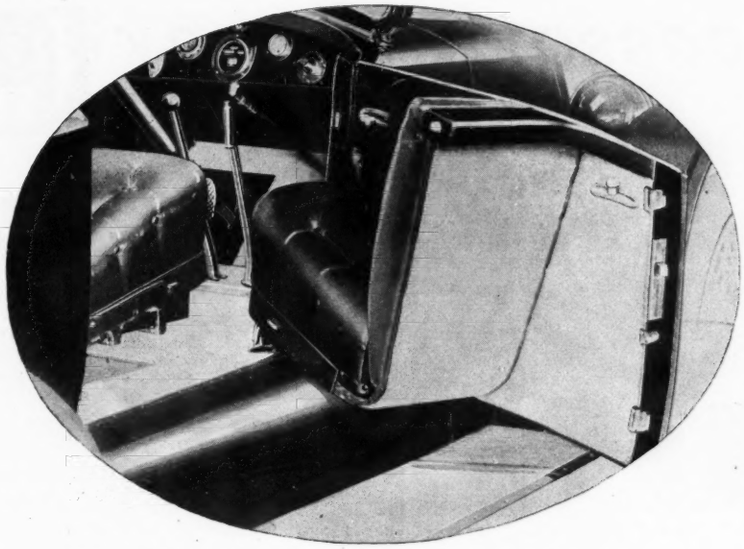
Duluth, Minn., May 11—A new industry to manufacture airplane engines and employ 100 men in the outset, to be established here, will be known as the Oldfield Motors Corp. It is to complete during this season a contract for 5000 6-hp. engines for gas tractors. The airplane engine which will be made by this company will have 125 hp. and will weigh 225 lb. It has met with the approval of the aviation section of the United States war department, and it is expected that a large contract will be placed with the company by the Government. The company has taken over the old plant here of several buildings. The main building is 140 by 160 ft. The president of the company is Lee W. Oldfield, and asosciated with him are John B. Cooper, John P. Ernster, Harry M. Giles and Alfred Kreig.

GIANT TIRE BUYS PLANT

Findlay, Ohio, May 14—The Giant Tire & Rubber Co. of Akron has purchased the Toledo-Findlay Tire & Rubber Co., this city, for $27,000. The sale was made by the receiver, A. T. Spitler. Operation of the plant will begin within the next ten days. The officers are: C. E. Hart, president; D. E. Reynolds, vice president; and J. E. Schafer, secretary and treasurer.

FABRI-CORD TO EQUIP PLANT

Salem, Ohio, May 12—The Fabri-Cord Tire Co., of which J. H. Christian is president, has taken over the plant of the American Case & Register Co., in this city, and will equip it for a production capacity of 500 tires daily.



Patented door on new Hackett roadster showing 7½ in. entrance to front seat

Easy Door Features Hackett

Entrance and Egress to Front and Rear Compartments Are by Patented Design

ONE of the most perplexing of the problems connected with the design of a four-passenger roadster is the provision of easy entrance and egress to both front and rear compartments. This problem has been solved in an unusual and remarkably simple way in the new Hackett four-passenger roadster.

This is accomplished by a patented door design which permits direct entrance to both front and rear seats, by incorporating one of the forward seats as a part of the door so that there is a passageway between the two forward seats only when the door is open.

The roadster as a whole is particularly noticeable for its boat-like lines and the fact that the top side line of the body is a well defined curve line extending from front to rear, and convex in relation to the ground.

When the door is open the entrance to the front seat is 7½ in. wide at the narrowest point, and the passageway to the rear is 10 in. wide. The total door width is 29 in. and 7 in. of the front seat swings open with the door. With the door open the width of the seat is 34 in., leaving plenty of room for two passengers to sit before the door is closed, and when it is shut the cushions fit closely together, the division in the seat appearing as a pleat in the upholstery.

The door may be opened from either the front or the rear, both door handles opening on the same shaft. As a double precaution there is a safety lock in addition to the regular lock. This safety lock can be put on by pulling back either the front or rear door handle.

The door is hung on two heavy, hidden coupe hinges and runs in a track, so that it cannot get out of position. This track also acts as a support when the door is closed and checks the swing when it is opened.

The body of this new roadster is mounted on the same chassis as the Hackett touring car, having a Golden, Belknap & Swartz engine and clutch, Grant-Lees gearbox, Walker-Weiss axles, with semi-floating gear, Hotchkiss drive, Foster steering gear, Connecticut ignition, Carter carbureter and gravity tank, and Dyneto 2-unit starting and lighting system. The wheelbase is 112 in. It sells for $888, with wire wheels $90 additional.

AIRCRAFT MAKERS ELECT

New York, May 11—H. B. Mingle has resigned as president of the Aircraft Manufacturers Association, due to the unusual expansion of the business of the Standard Aero Corp. and his other interests. The regular monthly meeting of the association was held May 9 and the following officers were elected: President, F. H. Russell, Burgess Co., Marblehead, Mass.; vice-president, A. H. Flint, L-W-F Engineering Co., College Point, L. I.; treasurer, Inglis M. Uppercu, Aeromarine Plane & Motor Co., New York; secretary, Benjamin L. Williams, New York; assistant treasurer, A. H. Flint.

INDIANAPOLIS SHUNS WAR STRIKES

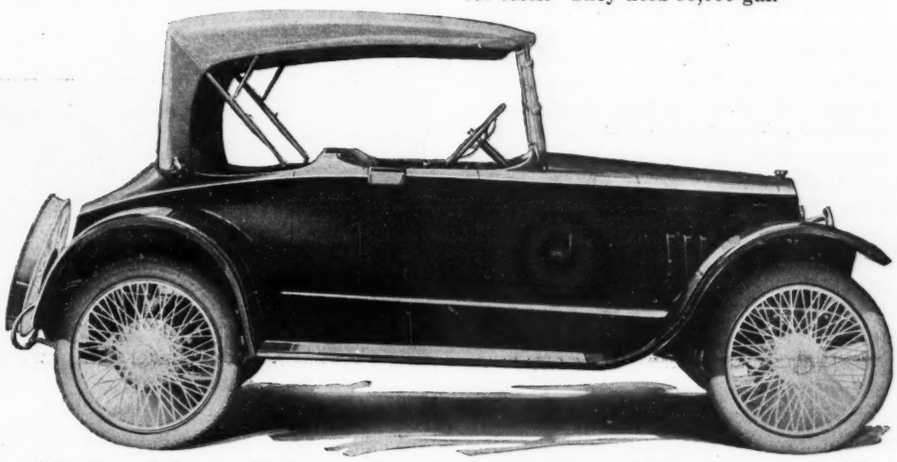
Indianapolis, Ind., May 13—Indianapolis motor car manufacturers are taking precautions to prevent agitators, who are said to be enemies of the government from gaining a foothold in their factories. In view of the labor conditions at Muncie, Ind., as a result of a machinists' strike involving 3000 men, no machinists from other cities are being employed unless their records are clear of connection with trouble-making organizations.

Secrecy guards the plans of the companies that are preparing to avoid trouble. Trusted employees, officials and members of office forces are watching the situation closely, and it is believed that no strife can be stirred up here by imported agitators.

The city council has passed an ordinance meant to prevent strikes during the duration of the war. Stringent provisions are contained in this ordinance, which would provide a fine of $300 and imprisonment for six months for any person who strikes in an industry which might be called upon by the federal government.

12,000,000 GAL. OIL YEARLY

Toledo, Ohio, May 12—The Willys-Overland Co. is using 12,000,000 gal. of fuel and lubricating oil yearly to operate and lubricate machinery, and to test its product. Six million gallons of fuel oil are consumed yearly in the heat treating and forge shops. Two thousand barrels of motor oil are used every twelve months. Six thousand gallons of screw cutting oil for machinery are consumed. Six tank cars filled with cylinder oil are used each month for dynamometer tests. They hold 35,000 gal.



Side view of the new Hackett roadster, showing the sharp angular lines of the body. The hood and cowl lengths total 45 in.

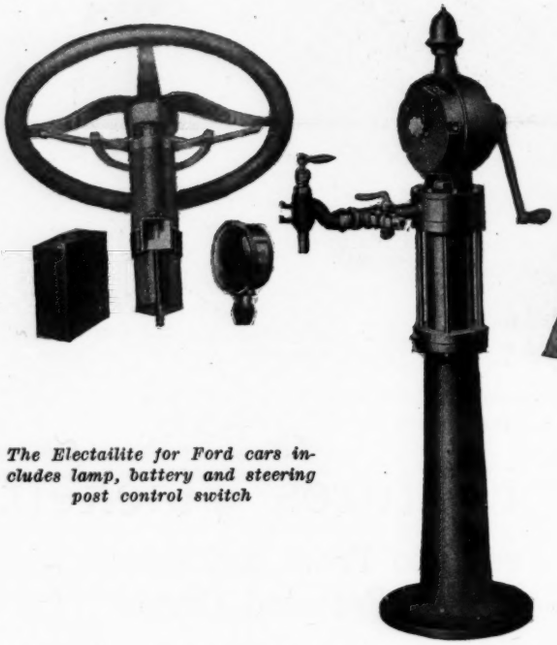
The Accessory Corner

Electailite for the Ford

ELECTAILITE consists of an electric tail lamp with storage battery and steering post control switch. When fully charged it will burn for at least 80 hrs., or about a month, it is said, average running. Necessary wires of proper length, battery clips and double tail lamp bracket for installation are included in the equipment. Price, $7.85. Detroit Starter Co., Detroit.

Shotwell Filling Stations

The Shotwell design of pumps, tanks, etc., embodies a sliding block and cross head which make it possible to operate the pump constantly in one direction without having to reverse the stroke. The working mechanism is inclosed, and the foot valve is placed directly above the tanks instead of inside, being accessible at all times through a cast iron manhole box with hinged top. Models for both private and public garages are manufactured. Shotwell Pump & Tank Co., Indianapolis, Ind.



The Electailite for Ford cars includes lamp, battery and steering post control switch

Shotwell filling station for public and private garages, left, and Peerless painting outfit

Valve Tool for Fords

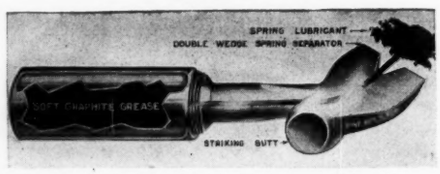
The Tu-Ford valve tool serves a double purpose, inasmuch as it first raises the spring and then automatically locks, making it simple to remove the valve with the spring in a raised position. The tool also holds the spring in place when the valve is removed for grinding. It is simple and compact in mechanical construction, and is made to fit any model of Ford car. The entire device has been treated with Parker Rust-Proof. Price $1, Tu-Ford Valve Tool Co., Bay City, Mich., maker; Wallace C. Hood Service Bureau, Detroit, distributor.

The Peerless Specialties

The Peerless specialties for the motor car include eighteen different products for all parts of the car. Besides offering these products separately an owner's outfit for painting the car is made up, with instructions as to use. The outfit contains 1 qt. black, battleship gray or Brewster green undercoat, the last two being 20 cents extra; 1 qt. clear finishing varnish; 1 pt. leather top dressing—mohair top dressing supplied without adidtional cost; 1 pt. cushion dressing; ½ pt. lamp enamel, gloss; ½ pt. cylinder enamel, black—gray without additional cost; two brushes; cotton waste; four sheets sandpaper; steel wool. Price, $4—Columbus Varnish Co., Columbus, Ohio.

Kepuruber Preservative

Rendering rubber impervious to checking and deterioration is the function of a new product known as Kepuruber. This is a liquid preservative to be applied to rubber articles of any kind at least once a year. It may be applied either with a cloth or brush, and the article treated should be out of service for a few days to allow the preparation to permeate the rubber thoroughly. After cost, not initial cost, has been a problem with all users of rubber, whether it be inner tubes, casings, hose connections, or any other rubber product. Deterioration has been a momentous factor with users of rubber and Kepuruber has been compounded with a view to eliminating after costs. It is not designed to restore rubber that has become checked, but all new rubber articles and those which have become hard through the exudation of the zinc, sulphur and other substances that go into the manufacture of rubber can be restored if the rubber has not checked. With an annual bath of Kepuruber the slow chemical change common to all untreated rubber is avoided and thus the article maintains its life, flexibility and elasticity. Kepuruber is a patented article, made by the Kepuruber Co., Blue Island, Ill., and is sold under a money-back guarantee in 25-, 59- and 75- cent sizes, as well as larger ones at $1, $1.50 and $5.



Tomahawk lubricator and lubricant for car springs

California Fuel Vaporizer

The California vaporizer is said to differ from others in that the mixture, as such, is not heated directly by the exhaust, though heat from the exhaust gas is used to evaporate the fuel. The primary step is the fine division of the fuel. The fuel and the air pass through the carbureter mouth in the ordinary manner, and all control and proportioning of the mixture takes place in the carbureter. A higher velocity is imparted to the fuel particles than to the air, and the particles separate from the air stream at the mouth of the vaporizer, the particles continuing into the device and the air going to the cylinder valve ports at the mouth of the chamber. Hot gases from the cylinders heat the device exteriorly. The fuel is vaporized by the heated surface,

but the air is subject to no direct heating. The contrary flow directions of fuel particles and vapor is said to give high vaporizing capacity of unit area of the inner chamber wall through the transfer of heat to the incoming fuel. California Vaporizer Co., Los Angeles, Cal.

Tomahawk Lubricator and Lubricant

The Tomahawk spring lubricator can be inserted with the pressure of the fingers or a light tap of a hammer if the car is jacked up. It is made of the finest drop-forged steel, hardened and nickel plated. Any form of grease can be fed from the container in the handle. The Tomahawk graphite spring lubricant comes in tube form, which makes it easy to refill the grease container. Each tube contains enough lubricant for 2000 miles. The lubricant does not evaporate and will not wash out or be absorbed by dust and dirt, it is claimed. The illustrations show the method of filling the lubricator. Prices, lubricator, $1.25; lubricant, 50 cents—Charles W. Manzel Co., Buffalo, N. Y.

Cushion Tired Wheels

The Luverne cushion tired wheel has been placed on the market for the benefit of those operating commercial cars and trucks which are equipped with pneumatic tires, and which cannot be equipped with cushion tires with the old wheels and rims. The wheels are made in any size necessary to fit the old hubs, and to meet the load-carrying requirements. They are equipped with Goodyear Motz tires. Luverne Automobile Co., Luverne, Minn.

Fouless Spark Plug

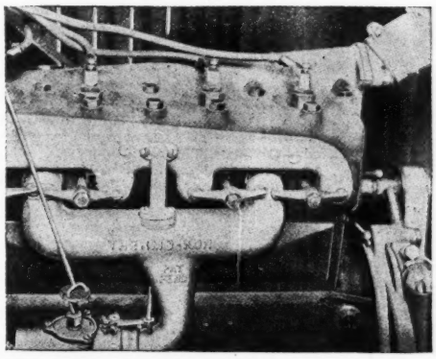
Instead of having one or more small separate wire terminals, the end of the Fouless spark plug is in the shape of a cage, which contains a movable ball. Vibration keeps the ball in motion, and in this way the plug is said to be kept clean and clear of all oil or carbon. The inner wall of the cage is designed so that the ball is always the same distance from the electrode, no matter what its position. The spark jumps from the center of the electrode to the ball and then from the ball to the terminal, the second spark being intensified. Price, $2—D. & D. Co., Chicago.

Apparatus for Service Station

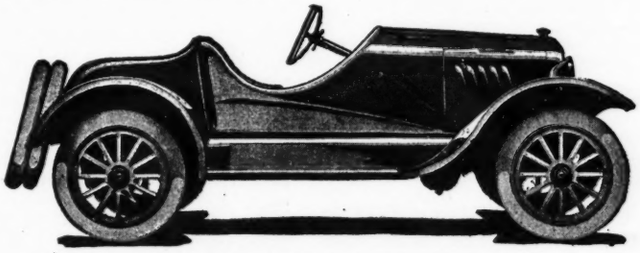
The Astra oxy-illuminating gas apparatus for lead burning employs artificial or

Fouless spark plug, left, and Astra lead burning apparatus for service stations

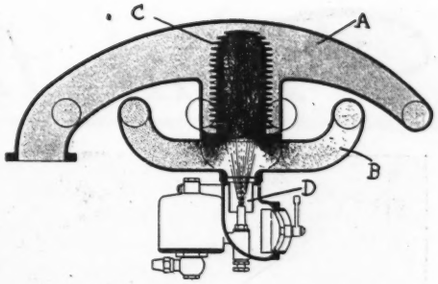
Laverne cushion tired wheel with Goodyear-Motz tire



Thermo-Kor inlet manifold installed on a car



Master sport body for Ford car



Diagrammatic drawing of California vaporizer

natural gas drawn directly from the gas mains, with tanked oxygen, and is said to be more economical for use in storage battery service stations for this reason. The apparatus is so designed that its different component parts can be added to existing welding or decarbonizing apparatus to provide lead-burning facilities, and other Astra appliances are offered to broaden the scope of lead burning to soldering, brazing, tempering, annealing, cylinder decarbonizing and acetylene welding. Two standard models are available, the stationary type S L P and the portable type P L P. Bradford-Ackerman Corp., New York, distributors; Ashton, Laird & Co., New York, makers.

Inlet Manifold for Fords

The Thermo-Kor inlet manifold is designed to give more power, speed and mileage and to lessen carbon deposits, valve grinding and skipping. It consists of a manifold fitted to take the place of the regular manifold of a Ford car, and has a hollow core on the inside of its main body, cast integrally with it. The hollow core is to take through it the hot exhaust gas by a small connecting pipe to the exhaust manifold of the engine. By the passage of the gases it becomes heated to such an extent that it turns the vapor-laden air into a gas, warmed and ready to ignite at the smallest spark. Installation requires 30 min. Price, $5—Clark Gas Power Co., Herkimer, N. Y.

Master Sport Bodies

The Master body converts the Ford into a snappy looking sport cart. It is of heavy steel over a reinforced wood frame and has roomy seats and plenty of leg room. The regular Ford gasoline tank is mounted beneath the deck behind the seat, where there is also baggage space. The seat backs are upholstered in long grain leather, and the interior of the body and the instrument board are covered with leather. A special heavy steel hood and die-stamped V-design radiator shell make the lines distinctive. Though the standard color is glossy black, special colors will be furnished for $10 extra. Other extras include crowned fenders at $15, special racing windshields, $10, and one man mohair top for $30. The body complete with tire carrier is $114—The Master Body Co., Detroit.

From the Four Winds

THE FOYS TAKE TO FLYERS—When Mr and Mrs. Eddie Foy and the seven little Foys played in Milwaukee this season they bought two Smith flyers from the A. O. Smith Corp., and this is the result of their purchase

MISSOURI Licenses 125,577 Cars—Missouri has issued 125,577 licenses since Feb. 1. The total number last year was 107,865.

Chicago Club Plans Run—The Chicago Automobile Club will hold its first sociability run of the season May 26 to Cedar Lake, where contests will be held. A secret running schedule will be arranged, and prizes will be given for the three contestants who finish nearest the secret time.

Lincoln Highway Feeder—A survey of the Delaware section of the Lincoln Highway feeder which will run from New York to Washington has been made. About 20 miles of it will be in Delaware, part of which is already newly-built road. The Delaware legislature has authorized a $500,000 loan for construction.

What Connecticut Roads Cost—The total amount for repairs and maintenance in Connecticut during the last three years is as follows: 1913-1914, $785,099; 1914-1915, $879,936; 1915-1916, $981,609. The total annual expenditure has increased steadily, but most of the advance is in the replacements. Maintenance has been: 1913-1914, $587,183; 1914-1915, $665,762; 1915-1916, $567,130.

DuPont on Delaware Commission—General T. Coleman duPont, who is building a boulevard from one end of Delaware to the other—100 miles—with the intention of presenting it to the State, has been selected as one of the members of the new state highway commission, which was created by the recent assembly. Other members are Josiah Marvel, Walter O. Hoffecker and Joseph E. Holland.

To Handle Connecticut's Motor Vehicles—W. B. Stockel has been appointed commissioner of motor vehicles in Connecticut for a term of four years at a salary of $4,000 per year. The appointment is in accordance with the new state law just passed by the legislature which removes from the secretary of state's office entirely the motor vehicle business of the state. All cases of violation of the law will be heard by the commissioner. Unlike the secretary of state he will not be subject to removal on change of political complexion of the state.

Coming Motor Events

CONTESTS

—1917—

May	30	Newark, N. J., track.
May	30	Washington, D. C., track.
May	30	Uniontown, Pa., speedway.
*May	30	Cincinnati, Ohio, speedway.
June	16	Chicago, speedway.
July	4	Visalia, Cal., road race.
July	4	Spokane, Wash., track.
July	4	Benton Harbor, Mich., track.
July	4	Uniontown, Pa., speedway.
July	4	Tacoma, Wash., speedway.
*July	4	Omaha, Neb., speedway.
July	14	Rochester, N. Y., hillclimb.
July	15	Missoula, Mont., track.
July	17-19	Intercity Reliability.
July	22	Anaconda, Mont., track.
July	29	Great Falls, Mont., track.
Aug.	5	Billings, Mont., track.
Aug.	17	Flemington, N. J., track.
*Sept.	3	Cincinnati, Ohio, speedway.
Sept.	3	Uniontown, Pa., speedway.
Sept.	6	Red Bank, N. J., track.
Sept.	8	Pike's Peak, Colo., hill climb.
*Sept.	15	Providence, R. I. speedway.
Sept.	22	Allentown, Pa., track.
Sept.	28	Trenton, N. J., track.
*Sept.	29	New York, speedway.
Oct.	6	Uniontown, Pa., speedway.
Oct.	6	Danbury, Conn., track.
*Oct.	13	Chicago, speedway.
Oct.	13	Richmond, Va., track.
Oct.	27	New York, speedway.

* A. A. A. Championship Award Event.

MEETINGS

June	25-26	Washington, D. C., S. A. E. midsummer.

SHOWS

June	20-27	Montreal used car show.
Aug.	6-18	Fremont, Neb., tractor demonstration.
Sept.	2- 9	Spokane, Wash., Interstate fair.
Sept.	9-15	Milwaukee show, State Park fair, West Allis.
Oct	13-28	Dallas, Tex., state fair.

Pennsylvania Has Record Licenses—During the first four months of this year the Pennsylvania highway department received in license money more than $2,500,000. This is $182,272 more than was collected during the entire year of 1916 and is $832,479 more than was collected during the corresponding four months of 1916.

Drives One-Cylinder Car Still—Dr. W. W. Arnold, of Colorado Springs, Col., purchased the one-cylinder Oldsmobile which he drives today in 1903. It still has the same cylinder, piston and piston rings with which it was equipped originally. The pioneer dealer of Colorado Springs sold the car to him and has since retired, but the one-cylinder is still doing duty.

When Street Cars Protest—The general manager of the Winnipeg street railway has written to the city council threatening suit for $1,000,000 if the jitneys are permitted to continue to operate. Breach of contract is claimed, and the $1,000,000 is alleged to be the amount lost through jitney competition during the period this competition has been permitted.

Connecticut Gains 33 Per Cent—Receipts in the motor vehicle department of the Connecticut secretary of state's office for April this year amounted to $183,506.51, as against $137,135.28 for the same period in 1916, an increase of $46,371.23. The receipts for the current fiscal year up to date amount to $808,020.80, as against $552,286.11 for the corresponding period a year ago.

How's This for Economy?—B. A. Small, a salesman in San Francisco, Cal., bought a Scripps-Booth roadster last summer in which to cover his territory. Now he reports that he has traveled more than 22,000 miles, is still on the same set of tires with which the car was fitted when bought, has averaged 27⅞ miles to the gallon of gasoline and has used 31½ gals. of oil.

Virginia Gains 4000 Cars—Virginia has received $400,000 for motor car licenses this year, an increase so far over the grand total for last year of approximately $125,000. Nearly 4000 more licenses have been issued than last year, and an additional 5000 license tags have been ordered, which will bring the total for this year to 50,000. The grand total for the year is expected to aggregate $500,000.

Highway Barred to Fowls—A county judge in New York has decided that if any fowl, bird or animal is killed by a motor car on a public road the owner of the car is not liable for damages, because he has a right to be on a public road and the deceased has no right to be there. Suit was brought when a motorist killed a turkey while motoring through Camden, N. Y. A justice of the peace awarded the turkey's owner $5, and the decision was given on appeal.

Old Spanish Trail Convention—The Old Spanish Trail Association will hold its third convention May 18-19 at Tallahassee, Fla. The conditions of the trail and the measures necessary to hasten completion; co-operation of counties in bridge building; state aid in addition to Federal aid for all trans-continental highways and rural mail routes; and bond issues for roads and bridges as an aid to agricultural development will be considered. Among the speakers are Governor Sidney J. Catts of Florida; L. W. Page, U. S. Department of Roads and Engineering, and David F. Houston, Secretary of Agriculture.

Among the Makers and Dealers

S K F Bearings on Coast—The S K F Ball Bearings Co. of California has been organized at San Francisco, Cal.

Fisher Company to Add—The Fisher Body Corp. will erect a five-story building in addition to its present plant.

Bowser Increases Wages—The S. F. Bowser & Company, Inc., Fort Wayne, has given its employees a wage increase of 25 to 30 per cent. About 900 employees profit by the advance.

To Sell Enger Plant—The plant of the Enger Motor Car Co., Cincinnati, Ohio, will be sold at public auction May 24 and 25 by Winternitz & Co., Chicago, for the receiver, L. J. Dauner.

Herbert to Demonstrate Tractor—Clifford V. Herbert, who has been working at the De Palma Mfg. Co. perfecting a tractor, is shipping the complete machine to Sufferin, N. Y., for demonstration before representatives of European countries.

Carey Gets Kelly-Springfield Promotion—J. D. Carey, formerly southern district manager of the Kelly-Springfield Tire Co., has been made manager of the carriage tire department. His headquarters will be at the general sales office, Cleveland, Ohio.

Bull's Eye Tire to Reorganize—The Bull's Eye Tread Tire Co., San Francisco, Cal., is to reorganize with a capital of $3,000,000 and become a subsidiary of the Pacific States Tire & Rubber Co. A factory for making a new patented tire will be built and equipped at Sunnyvale.

Kaye Joins Kissel Company—Ralph Kaye has assumed charge of the advertising and publicity department of the Kissel Motor Car Co., Hartford, Wis. Mr. Kaye is a member of the staff of the Otto J. Kock Advertising Agency, Milwaukee, Wis., which has handled Kisselkar advertising for ten years.

Doering Is R. & L. Sales Manager—H. H. Doering has been appointed sales manager of the Baker R. & L. Co. For the last three years or so he has been manager of the Philadelphia branch and before that was sales and advertising manager for the Ohio Electric Car Co.

Goodyear in Philippine Parade—Erlanger & Galinger, dealers, had six used Goodyear tires in the recent Philippine Carnival held at Manila, P. I., each of which had seen from six to eight months' continuous service and had mileages of from 11,200 to 16,000. Each tire carried a placard giving its record.

Universal Rim Reorganizes Wholesale Business—The wholesale and manufacturing department of the Universal Rim Co. will be continued under the firm name of Stone-Thompson Mfg. Co., which takes over the entire distribution of Baker demountable rims and the manufacture of Stone shock absorbers and other specialties. The management of the department remains the same.

New Men With Bailey Differential—J. R. Brooking has been made district manager for the Chicago, Minneapolis and St. Louis territory of the Bailey Non-Stall Differential Corp. He was field man for the Studebaker Corp. and before that served the Willys-Overland Co. in the Alberta district. Eugene R. Johnston, formerly with the Maxwell, has been made district manager for territory west of Kansas City. J. B. Schroeder, formerly with the Miller Rubber Co. and the Thermoid Rubber Co., is the new district manager in Michigan, Ohio and Indiana.

A STUDEBAKER DOES A RUNNING BROAD—The snapshot is of a leap made by a Studebaker car at Salina, Kan., from a platform 15 ft. long and 15 in. high. The car was traveling about 55 m.p.h. when it struck the platform. The distance from the platform to where the rear wheels struck the ground was 54 ft. 2 in.

Paul B. Franklin, also formerly with the Thermoid, will specialize on Bailey Differential service with fleet owners.

France Places Large Tire Order Here—The French government has ordered 200 Troy trailers, equipped with United States solid truck tires.

Top Company Locates at Pontiac—The Detroit Weather Proof Top Co. will locate at Pontiac Mich. It has arranged to occupy five buildings formerly belonging to the old Flanders plant.

Richardson-Phenix Co. Builds—The Richardson-Phenix Co., Milwaukee, Wis., maker of lubricating devices, has awarded contracts for the erection of 100 by 140-foot shop addition, to cost about $60,000 complete. The building will be ready for occupancy June 15 or July 1.

Cravens to Elkhart Company—George W. Cravens has been appointed chief engineer of the Elkhart Carriage & Motor Car Co. Mr. Cravens is one of the charter members of the Aero Club of America and has acted as consulting engineer and specialized in the development of motor cars and parts for several years.

Paterson Heads Hudson-Phillips Co.—E. O. Paterson has been elected president of the Hudson-Phillips Motor Car Co., St. Louis, Mo., succeeding John H. Phillips, who recently resigned. Mr. Phillips was formerly district manager for the Hudson Motor Car of Detroit, and was with that company for six and a half years.

Richmond Dealers Organize—The Richmond, Va., Automobile Dealers Association Board of Trade, Inc., has been chartered. One of the first actions of the new body was to name an appraiser who will appraise all cars offered in trade for new cars. The appraiser will keep a record of the individual cars for the use of the dealers at any time.

Gramm-Bernstein Sales Corp. Formed—The contract between the Gramm-Bernstein Motor Truck Co., Lima, Ohio, and the R. E. Taylor Corp., New York, distributor in New York and New England, has been canceled and the Gramm-Bernstein Sales Corp. has been organized to handle both wholesale and retail distribution in that territory. C. W. Moody will direct the new organization, which will have offices and a warehouse and service station in New York.

Vesta Equipment for Circus—The Vesta Lighting equipment has been adopted for use in the motorized circus of Spillman Bros.

Wells to Hyatt Roller Bearing—R. E. Wells has been appointed engineer of the motor car division of the Hyatt Roller Bearing Co. Mr. Wells was formerly assistant engineer of the Hupp Motor Car Co.

Champion Spark Plugs for Circus—The Champion spark plug has been adopted as the spark plug equipment for the motor vehicles in the United States Circus Corp., which is to use Kelly-Springfield trucks to transport its performers and outfit.

Wisconsin Issues 100,000 Licenses—Wisconsin license No. 100,000 has been issued, registrations thus showing a gain of 56 per cent over the same period a year ago, when the total was 64,000. Wisconsin is expected to register at least 170,000 cars during 1917, compared with 115,640 for 1916.

Gilbert Gets Promotion—P. W. Gilbert, sales manager of the rim and tube division of the Standard Parts Co., has been made assistant general manager. B. W. Quayle, who has been the general sales representative, succeeds Mr. Gilbert in the rim and tube sales management.

Buys by Trainload—The Reo Motor Car Co. shipped a trainload of fifty-one flat cars, each carrying three passenger or truck vehicles, to the Los Angeles dealer May 1. This is the second shipment in four weeks on the same set of flat cars. The Los Angeles dealer finds that trainloads come through in from nine to fourteen days, while less than a trainload takes from four to six weeks.

Edgerton Trailer Company Elects—The Edgerton Highway Trailer Co., Edgerton, Wis., capital stock $180,000, has elected the following officers: President and general manager, James W. Menhall; vice-president, M. Johnson; secretary, E. Z. Menhall; treasurer, A. J. McIntosh; assistant secretary and treasurer, C. A. Florey. The company has taken possession of the two factories of the Edgerton Wagon Co. and will commence active production of two and four-wheeled

trailers, designed and patented by James W. Menhall, who, until recently, was vice-president of the Warner Auto-Trailer Co.

Chevrolet Factory for Salt Lake—The Chevrolet Motor Co. will build a large assembling plant at Salt Lake City, Utah.

Blanchard Elected Vice-President—Frederick C. Blanchard, formerly works manager of the Ashcroft Mfg. Co., has been elected vice-president in charge of manufacturing for the Detroit Lubricator Co.

Oldham Is Stationed at St. Louis—C. A. Oldham has been made the district manager of the United States Tire & Rubber Co. in St. Louis, Mo. Mr. Oldham was formerly resident manager at Kansas City.

Jameson to Briscoe Factory—W. B. Jameson has been appointed in charge of the factory of the Briscoe Motor Corp. Mr. Jameson was formerly in charge of the New Castle, Ind., factory of the Maxwell Motor Car Co.

Bower to Harry Newman Co.—Joseph Bower has been appointed retail sales manager of the Harry Newman Co., Chicago, Indianapolis and St. Louis, distributor of the HAL. Mr. Bower has been with exporters of motor cars in New York.

Crow-Elkhart Opens Export Department—Pierre Maas is the export manager in the new foreign department established by the Crow-Elkhart Motor Co. Mr. Maas for eight years was manager of the export business of the Swift Cycle & Motor Co., Coventry, England, and before that was in the motor car business in Paris and Brussels.

Thomas Brothers Open Detroit Offices—W. O. and T. R. Thomas have opened headquarters at Detroit as engineering specialists and will act as consulting engineers for motor car manufacturers. They formerly had offices in New York and England and were consulting engineers for the Mercedes company in Germany, the Minerva in Belgium, Laurin and Klement of Austria and Panhard-Levassor of France.

Eisemann Magneto Promotes Mills—P. E. Mills, formerly assistant chief engineer for the Eisemann Magneto Co., has been made sales engineer.

American Oil Products Plant Burns—The plant of the American Oil Products Co., Buffalo, N. Y., has been completely destroyed by fire. The company expects to resume at once.

Auto Products in New Plant—The Detroit Auto Products Co. is located in its new factory at Detroit, where it will manufacture many of the products used in its Ford body equipment, which it recently bought from other manufacturers.

Marvel in New Factory—The Marvel Machinery Co. has entered its new factory in Minneapolis, Minn. The plant has 15,000 sq. ft. of floor space and will enable the company to treble its production of cylinder reboring machines.

Lane Resigns from Hyatt—Ralph S. Lane, chief engineer of the Hyatt Roller Bearing Co., has resigned to devote his time to the operation of the Bearings Service Co. and the United Motors Service, Inc., of which companies he is president.

Studebaker Employees Become Citizens—From more than a total of 1100 foreigners employed by the Studebaker Corp. in one of its Detroit plants only three refused to become American citizens. Every man of German birth in the plant signified his willingness to become an American citizen.

Crow-Elkhart Has Own Police—The use of so many circus tents and temporary structures to meet the demand for Crow-Elkhart cars has resulted in such a scattering of the company's equipment and property that the Crow-Elkhart Motor Co. employs a police force of its own to protect its plant. Officers of the company have had special policemen sworn in for this. The men will be uniformed and will work in 12-hr. shifts.

Herst With M. & S.—W. F. Herst has been appointed general manager of the M & S Corp. Mr. Herst was formerly with the Brown-Lipe Gear Co.

Wilson to Harroun Company—N. Wilson has been appointed assistant traffic manager of the Harroun Motors Corp. Mr. Wilson was formerly assistant traffic manager of the Maxwell Motor Co.

Garford Gets Record Order—The Garford Motor Truck Co. has received an order from the New York City department of street cleaning for thirty-four tractors. The amount involved is about $200,000.

Wisconsin Motor Is Building—The Wisconsin Motor Mfg. Co., Milwaukee, Wis., is building a machine and assembling shop addition, 115 by 275 ft. The concern recently increased its capital stock from $350,000 to $1,000,000 to provide for the extensions and the growth of the business. The new facilities will be available about July 1, it is expected.

To Make Gasoline Tanks—The Shotwell Pump & Tank Co. has been organized at Indianapolis to manufacture pumps and underground tanks for the handling of gasoline and oils. Charles W. Shotwell is president. Other officers are R. W. Murphy, treasurer; F. B. Fowler, secretary; B. P. Benritze, production manager, and J. H. McConnell, sales manager.

New Position for Budlong—Milton J. Budlong has been appointed general manager for Gaston, Williams & Wigmore. Mr. Budlong is also vice-president of the corporation. Prior to his connection with Gaston, Williams & Wigmore he had been president of the Electric Vehicle Co. of Hartford, president of the Packard Motor Co. of New York, Philadelphia and Chicago and assistant general manager of the Packard Co. of Detroit.

Recent Incorporations

Beloit, Wis.—Warner Mfg. Co.; capital stock, $50,000; to manufacture and sell motor car trailers, accessories, etc.; incorporators, A. P. Warner, L. A. Avery and M. O. Mouat.

Charleston, Va.—Craig-Alderson Auto Co.; to operate a general motor car business; capital stock, $20,000; incorporators, C. H. Craig, L. H. Craig, J. B. Alderson, R. C. Alderson and P. J. Newlon.

Coshocton, Ohio.—Crowthers Auto Sales Co.; capital stock, $10,000; incorporators, A. L. Crowthers, Fred Balmer, C. Guy Bevington and E. P. Selby.

Chelsea, Mich.—Chelsea Steel Ball Co.; capital stock, $75,000; incorporators, T. F. Callohan, C. Lehman, M. J. Dunkel and L. P. Freeman.

Cleveland, Ohio.—Motor Truck Sales Co.; capital stock, $25,000; incorporators, Henry J. Foster, Herbert Andress, Ivan Katzenstein, Howard Katzenstein nad Earl Katzenstein.

Chicago.—Illinois Auto Truck Co.; capital stock, $25,000; incorporators, Edward F. Dunne, Jr., and William J. Corboy.

Chicago.—Excel Garage Co.; capital stock, $5,000; incorporators, J. O. Schack, E. B. Lucius and J. S. Matthews.

Clarksville, Tenn.—Royal Garage & Machine Co.; capital stock, $10,000; incorporators, J. D. Fraughber, C. W. Rudolph, J. H. Smith, Jr., S. P. Gold and W. A. Chambers.

Cincinnati, Ohio.—Acorn Motor Sales Co.; capital stock, $20,000; to sell motor cars; incorporators, H. M. Pollock, Claude V. Black, A. L. Quill, J. Laughlin and John C. Harmann.

Canton, Ohio.—Garage & Repair Co.; capital stock, $10,000; to operate a garage and repair shop; incorporators, V. R. Levinger, Robert Goudy, Guy M. Wilson, McLville Howald and A. O. Evans.

Clovis, N. M.—New State Auto Co.; capital stock, $15,000; incorporators, L. E. Shaw, S. T. Lawrence, H. A. Miller and C A. Scheurich.

Detroit.—The Axan-McLean Co.; capital stock, $50,000; to make motor car parts; incorporators, Frederick Axan, Hugh McLean and Clyde McLean.

Dover, Del.—First National Finance Corp.; to deal in and with motor cars, loan money on security, etc.; capital stock, $3,000,000; incorporators, F. R. Hansell, G. H. B. Martin and S. C. Seymour.

Los Angeles, Cal.—Peerless Wheel Co.; to manufacture motor car wheels; capital stock, $15,000; incorporators, F. E. Powers, G. E. Somarindyk and R. A. Armstrong.

Milwaukee, Wis.—Welch Chemical Works; capital stock, $50,000; incorporators, H. D. Welch, G. R. Colburn and R. C. Almour.

New York—Perfect Body Co., to manufacture motor car bodies and supplies; capital stock, $10,000; incorporators, K. Torjath, P. Magy and J. Bander.

Owensboro, Ky.—Franks Tractor-Cultivator Co.; incorporators, W. O. Hoskins, W. L. Morton, James Jones and others; capital stock, $50,000; to manufacture a tractor-cultivator.

Oklahoma City, Okla.—United States Garage; capital stock, $50,000; incorporators, H. B. Shanks, E. E. Lucas and A. A. Holmes.

Pawuska, Okla.—Osate Garage; capital stock, $5,000; incorporators, C. W. Stephens, C. T. Easterbrock and Din H. Anderson.

Philadelphia, Pa.—H. J. Graham Engineering Corp., to manufacture front-drive chassis for motor trucks; capital stock, $35,000; incorporators, Frederick W. Unger, H. J. Graham and C. Yarnall Abbott.

Racine, Wis.—Western Coil & Electric Co., to manufacture and sell electrical devices, equipment, etc.; capital stock, $30,000; incorporators, James W. Gilson, William Mitchell Lewis and James V. Rohan.

Racine, Wis.—Western Pattern & Mfg. Co., to manufacture wood and metal patterns: capital stock, $10,000; incorporators, K. F. Jacobsen, Einer Beck, Miller Petterson, Oscar Jacobsen and Anton Petterson.

Racine, Wis.—Racine Motor Truck Co., to manufacture, assemble, repair, buy and sell motor vehicles and deal in tools, fixtures, etc.; capital stock, $50,000; incorporators, Charles P. Piggins, Ira L. Miller and Fred H. Piggins.

Rochester, N. Y.—Giant Tire & Sales Co.; to manufacture tires; capital stock, $10,000; incorporators, J. M. Johnson, L. Z. Johnson, A. L. Dutton, E. F. Gamrod and J. A. Huber.

Rochelle, Ill.—Rochelle Automobile Co.; capital stock, $5,000; incorporators, W. D. Storer, N. D. Trinter and B. J. Parker.

St. Joseph, Mo.—Robinson Cadillac Motor Car Co.; capital stock, $10,000; incorporators, Walter H. Robinson, K. W. Robinson, Melvin E. Binswanger and L. J. Binswanger.

St. Louis, Mo.—Kerosene Motor & Tractor Co., to manufacture motor vehicles and trucks; capital stock, $10,000; incorporators, George P. Weber, James M. Leonard and G. C. Weber.

St. Louis, Mo.—Equipment Motor Truck Co.; capital stock, $50,000; incorporators, H. J. Dunker, S. M. Laithe and W. A. Yackley, Jr.; to deal in motor vehicles and accessories of all kinds.

Sidney, Ohio.—Sidney Universal Car Co.; capital stock, $10,000; to sell motor cars; incorporators, Emerson Dean, S. S. Faulkner, C. E. Emerick, William J. Sherer and Fred Martin.

Sussex, Wis.—Sussex Garage Co.; capital stock, $5,000; incorporators, John P. Stier, William Brown, William J. Smith, August Manke and W. F. Stuewe.

Sapulpa, Okla.—Western Auto Co.; capital stock, $5,000; incorporators, B. T. Glover, L. M. Glover and J. A. Ryan.

Two Rivers, Wis.—Two Rivers Plating Works; capital stock, $40,000; incorporators, Henry Mixa, A. Schmuluman, Emil Frenz and M. Gaffney.

Toledo, Ohio—Crow-Elkhart Sales Co., to sell motor cars; capital stock, $20,000; incorporators, B. H. Christian, Joseph A. Riopelle, J. B. Grouch, J. M. Main and F. A. Herman.

Wichita, Kan.—Fast-Oswait Motor Co.; capital stock, $100,000; incorporators, Judson C. Fast, Walter L. Oswait and Bertha L. Fast.

Youngstown, Ohio—Sloss Motor and Repair Co.; $5,000; to sell motor cars; D. M. Strachan, E. J. Powell, B. M. Powell, Henry G. Sloss and M. M. Conroy.

Youngstown, Ohio—Hoffmaster-Gifford Motor Co., to sell motor cars; capital stock, $20,000; incorporators, L. P. Hoffmaster, L. B. Hoffmaster, Chas. A. Gifford, A. W. Gifford and Guy D. Ohl.

Seattle, Wash.—Grinwald Auto Supply Co., Inc.; capital stock, $10,000; incorporators, Edward J. Grinwald, Herbert H. MacGinnitie and George M. Horton.

Texarkana, Ark.—Overland-Texarkana Co.; capital stock, $25,000; incorporators, J. K. Wadley, R. E. Deve and Putnam Dickinson.